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ABSTRACT

Presented in these teacher's guides for grades two through four are lesson plans and ideas for integrating mathematics and environmental education. Each lesson originates with a fundamental concept pertaining to the environment and states, in addition, its discipline area, subject area, and problem orientation. Following this, behavioral objectives and suggested learning experiences are outlined. Behavioral objectives include cognitive and affective objectives and skills to be learned, while learning experiences list student-centered in-class activities and outside resource and community activities. Space is provided for teachers to note resource and reference materials--publications, audio-visual aids, and community resources. The guides are supplementary in nature and the lessons or episodes are designed to be placed in existing course content at appropriate times. This work was prepared under an ESEA Title III contract for Project I-C-E (Instruction-Curriculum-Environment). (BL)

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Project I - C - E INSTRUCTION - CURRICULUM - ENVIRONMENT

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A SUPPLEMENTARY PROGRAM FOR ENVIRONMENTAL EDUCATION

DISCIPLINE AREA Mathematics GRADE 2

Produced under Title III E.S.E.A.
PROJECT I-C-E
Serving Schools in CESA's 3-8-9
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PROGRAM FOR ENVIRONMENTAL EDUCATION

Mathematics GRADE 2

itle III E.S.E.A.
in CESA's 3-8-9
sin 54301
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PREFACE

"Oikus" for house is the Greek origin of the term "ecology". studies our house--whatever or wherever it may be. Like an un expand or contract to fit many ranges--natural and man-made. environments, our many "houses" if we omit rancor and cite lon complexities. Our "oikus" uses the insights of all subjects. multidisciplinary program like ours necessarily results. Also a long time, our program ranges K thru 12. The environment mi values. These values have their origin in the "oikus" of our minds. Let us become masters of our house by replacing the G with "Know thyself and thine house."

1. Written and designed by your fellow teachers, this guide is to fit appropriately into existing, logical course content.
2. Each page or episode offers suggestions. Knowing your stud to adapt or adopt. Limitless chances are here for your exp Many episodes are self contained, some open-minded, still o developed over a few days.
3. Try these episodes, but please pre-plan. Why? Simply, no and no curriculum will work unless viewed in the context of
4. React to this guide with scratch ideas and notes on the epi
5. After using an episode, fill out the attached evaluation fo duplicate, or request more of these forms. Send them singl We sincerely want your reactions or suggestions--negative a evaluations are the key in telling us "what works" and in a the guides.

TERMS AND ABBREVIATIONS

ICE RMC is Project ICE Resource Materials Center serving all school districts in CESA 3, 8, and 9. Check the Project ICE B resources. Our address and phone number is on this guide's co or call us for any materials or help.

BAVI is Bureau of Audio Visual Instruction, 1327 University Madison, Wisconsin 53701 (Phone: 608-262-1644).

Cognitive means a measurable mental skill, ability, or proce

Affective refers to student attitudes, values, and feelings.

PREFACE

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"houses" if we omit rancor and cite long range gains, costs, and
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terials or help.
udio Visual Instruction, 1327 University Avenue, P. O. Box 2093,
701 (Phone: 608-262-1644).
easurable mental skill, ability, or process based on factual data.
student attitudes, values, and feelings.

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Van Susteren, Holy Name	
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en Wolf, Kimberly	
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ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 1. Energy from the sun, the basic source of all energy, is converted through plant photosynthesis into a form all living things can use for life processes.

Discipline Area Mathemati

Subject Measureme

Problem Orientation Sun En

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPER	
Cognitive: Each student will make graphs to show the difference of growth in 5 different plants. Affective: The student will support the need of adequate sunlight for all plant life. Skills to be Learned Observation Discussion Making Graphs Comparison	I. Student-Centered in class activity A. Plant Growth Comparison Graph 1. Plant 4 seeds in same size pots and soil. a. First pot place in sunlight b. Second in shady place c. Third in dark place. d. Plant a small bean seed in one pot e. Plant a larger bean seed in another. 2. Watch growth of all pots As soon as a plant appears, record date, height, or girth, or number of leaves. Continue for 2 weeks recording each day. 3. Make a graph for each plant showing the growth over number of days 4. Compare the graphs of all the plants. Discuss the difference of each plant and why. *Use one of these ideas or divide class into groups.	II. Out Com A. Tak school tation Compar the be

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Discipline Area Mathematics

Subject Measurement - Graphs

Problem Orientation Sun Energy Grade 2

S

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. Plant Growth Comparison Graph

1. Plant 4 seeds in same size pots and soil.
   a. First pot place in sunlight
   b. Second in shady place
   c. Third in dark place.
   d. Plant a small bean seed in one pot
   e. Plant a larger bean seed in another.
2. Watch growth of all pots As soon as a plant appears, record date, height, or girth, or number of leaves. Continue for 2 weeks recording each day.
3. Make a graph for each plant showing the growth over number of days
4. Compare the graphs of all the plants. Discuss the difference of each plant and why.

*Use one of these ideas or divide class into groups.

II. Outside Resource and Community Activities

A. Take a field trip around school ground to look at vegetation on each side of building. Compare the sides as to where the best growth occurs.

Resource and Reference Materials	Continued and Additional Suggested Lear
Publications: Audio-Visual: movie - Plants and Their Importance (color) 11 min. BAVI Community: County Agricultural Agent	

ls	Continued and Additional Suggested Learning Experiences

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 2. All living organisms interact among themselves and their environment, forming an intricate unit called an ecosystem.

Discipline Area Mathematics

Subject Sets

Problem Orientation Ecosyste

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERI	
Cognitive: The child will observe 3 animals for 5 minutes each, listing all the objects the animal comes in contact with during that time. Affective: The child will have awareness of how different systems interact Skills to be Learned 1. Observation 2. Listing 3. Counting 4. Discussion	I. Student-Centered in class activity A. Have each child observe 3 animals, for 5 minutes each. Number and list all the things the animal touches during the given time. Child draws a picture of each animal and the items it interacts with. Write the number of all the objects in that set B. Using the pictures from part A. what would happen if one or more of the objects was removed from the set. Ex: Bird-set of tree, ground warm air. Number 5 objects in set , take away the worm 4 objects left. What would happen if worm taken away? C. Observe other sets besides animals, such as schools, homes, etc.	II. Outs Comm A. Vis unit t acts.

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Discipline Area Mathematics

Subject Sets

Problem Orientation Ecosystems Grade 2

SUGGESTED LEARNING EXPERIENCES

Student-Centered in class activity

. Have each child observe animals, for 5 minutes each. umber and list all the things he animal touches during he given time. Child draws picture of each animal and he items it interacts with. rite the number of all the bjects in that set

. Using the pictures from art A. what would happen if ne or more of the objects as removed from the set. Ex: Bird-set of tree, ground warm air. Number 5 objects n set , take away the worm 4 objects left. What would happen if worm taken away?

. Observe other sets besides nimals, such as schools, homes, tc.

II. Outside Resource and Community Activities

A. Visit the local government unit to see how each part interacts.

Resource and Reference Materials	Continued and Additional Suggest
Publications: Community Planning Handbook Ginn & Co. I-C-E # 100 G RMC Audio-Visual: film Community (color) 11 min. $4.00 BAVI no 5245 Sea (color) 28 min. $9.00 BAVI no. 5386 Community: Farm	

ials	Continued and Additional Suggested Learning Experience
n.	

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 3. Environmental factors are limiting on the numbers of organisms living within their influence, thus, each environment has a carrying capacity.

Discipline Area Mathe

Subject - Measu

Problem Orientation Car

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING E
Cognitive: The children will, through experimenting find out which container holds the most popcorn. Affective: The child will be able to choose which area can hold the larger amount. Skills to be Learned Listening Experimenting Discussion Comparing	I. Student-Centered in class activity A. Tell the children Pete's Popcorn Problem 1. Supplies for class a. Two containers of different volumes with deceptive shapes so that children cannot tell at a glance which is larger. b. Popcorn or some similar material in 1 large container. c. For each group of 3 or 4 children 1 tray with 2 small containers of different volumes and shapes. Children can bring this from home. 1 plastic container (12 oz) 2. After story ask these questions: What did Pete want to find out? (which container would hold the most popcorn). How could he find out? Ask the children for suggestions. (Continued on reverse side)

II.

ntal factors are limiting
rs of organisms living
influence, thus, each
as a carrying capacity.

Discipline Area Mathematics

Subject - Measurement

Problem Orientation Carrying Capacity Grade 2

JECTIVES	SUGGESTED LEARNING EXPERIENCES	
hildren perimenting ontainer opcorn. child choose old the rned	I. Student-Centered in class activity A. Tell the children Pete's Popcorn Problem 1. Supplies for class a. Two containers of different volumes with deceptive shapes so that children cannot tell at a glance which is larger. b. Popcorn or some similar material in 1 large container. c. For each group of 3 or 4 children 1 tray with 2 small containers of different volumes and shapes. Children can bring this from home. 1 plastic container (12 oz) 2. After story ask these questions: What did Pete want to find out? (which container would hold the most popcorn). How could he find out? Ask the children for suggestions. (Continued on reverse side)	II. Outside Resource and Community Activities A. Take a quart of sand, gravel, clay, and rich soil. (You may use any other kinds available) 1. Put water into the containers until the soil will absorb no more. 2. Compare the measurements to see the different capacities of soil to hold water.

Resource and Reference Materials

Publications:

Introducing Measurement
Minnemast-Minnesota Mathematics and Science Teaching Project
Corona, Philip, Things that Measure New York, Prentice Hall 1962 I-C-E 110 UN 5
RMC

Audio-Visual:

Community:
County agent on kinds of soil

Continued and Additional Sugge

I. (cont)
3. Divide class into small
two small unfilled contain
container filled with popc
a. Ask the children to f
they would use if they w
popcorn.
b. Watch children to see

Pete's Popcorn

Pete liked popcorn very much!
buttered . He liked popcorn bal
ate popcorn while he watched T
he went to bed. He liked going
could buy an especially big bo
would even eat popcorn for bre
would let him.

One day Pete's father told him
for him.

"What is it, Daddy? What is it
"You will find out on Saturday
surprise very much!"

Pete woke up early on Saturday
"Today's Saturday, Dad. Tell m
please," Pete asked.
"We will drive to the surprise
Soon they came to a big, big b
didn't know many of the words
one! POPCORN!
"A friend of mine owns this po
"I told him how much you like
workers here getting all kinds
to buy."
Pete and his father met the ma
(continued on next page)

Materials	Continued and Additional Suggested Learning Experiences
hematics oject that ice 5	I. (cont) 3. Divide class into small groups and give each group two small unfilled containers and the large plastic container filled with popcorn. a. Ask the children to find out which container they would use if they were going to take home some popcorn. b. Watch children to see how they decide. Pete's Popcorn Problem Pete liked popcorn very much! He ate popcorn plain and buttered . He liked popcorn balls and caramel popcorn. He ate popcorn while he watched TV and as a snack just before he went to bed. He liked going to the movies because he could buy an especially big box of popcorn there! Pete would even eat popcorn for breakfast -- if only his mother would let him. One day Pete's father told him he had a special surprise for him. "What is it, Daddy? What is it? Pete asked. "You will find out on Saturday. I know you will like this surprise very much!" Pete woke up early on Saturday. So did Daddy. "Today's Saturday, Dad. Tell me what my surprise is -- please," Pete asked. "We will drive to the surprise. Come On! Let's get started" Soon they came to a big, big building, Pete saw a sign . He didn't know many of the words on the sign but he did know one! POPCORN! "A friend of mine owns this popcorn factory," Daddy said, "I told him how much you like popcorn. He said we could see workers here getting all kinds of popcorn ready for people to buy." Pete and his father met the man who owned the factory and (continued on next page)

he showed them the popping machines. Then Pete saw how they
the popcorn and how they made popcorn balls.

When they had seen all these things the man said, "Would yo
to take some popcorn home?"

"Oh yes!" Pete answered.

"You must decide one thing. Here are some different contain
(Point out the two containers you have set out.) "You may f
of them with popcorn."

Pete looked at the containers. They were different shapes.
to be sure he took as much popcorn as he could. He knew he

Pete's Popcorn Problem (continued)

popping machines. Then Pete saw how they packaged
w they made popcorn balls.

all these things the man said, "Would you like
rn home?"

wered.

ne thing. Here are some different containers."
containers you have set out.) "You may fill one
rn."

containers. They were different shapes. He wanted
as much popcorn as he could. He knew he had a problem!

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT

4. An adequate supply of pure water is essential for life.

Discipline Area Mathema

Subject Measure

Problem Orientation Water

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EX	II.
Cognirive: The student will measure the speed, depth, width. and temperature of a small stream. Affective: A student will question the differences between a clean and polluted stream. Skills to be Learned 1. Comparing 2. Measuring	I. Student-Centered in class activity A. If a small stream is near Rural Studies - Stream 1.a. Find the spot there the stream is the widest. b. Find the spot where the stream is the narrowest. c. How are the spots the same? d. How are the spots different? 2.a. Find the deepest spot. b. find the shallow spots c. Where is deep water found? 3. Find speed of river (float a block of wood and time its flow) 4. Find temperature of water. B. More ideas on water in the ecolab. C. Compare a few of the stream properties with a river. D. Compare a clean stream with a polluted one of about the same size. (Continued on reverse side)	A. ar fo B. th hi

Discipline Area Mathematics

Subject Measurement - length

Problem Orientation Water Quality Grade 2

SUGGESTED LEARNING EXPERIENCES

. Student-Centered in class activity

. If a small stream is near
ural Studies - Stream

1.a. Find the spot there the stream is the widest.
b. Find the spot where the stream is the narrowest.
c. How are the spots the same?
d. How are the spots different?

2.a. Find the deepest spot.
b. find the shallow spots
c. Where is deep water found.

3. Find speed of river (float a block of wood and time its flow)

4. Find temperature of water.

. More ideas on water in he ecolab.

. Compare a few of the tream properties with a iver.

. Compare a clean stream ith a polluted one of about he same size.

(Continued on reverse side)

II. Outside Resource and Community Activities

A. While at the stream sketch and count kinds of plants found in it.

B. Have a trout fisherman tell the effect of pollution on his trout fishing creek.

Resource and Refernece Materials	Continued and Additional Sugges
Publications: Kit # 21 at I-C-E RMC Ecolab- a study of the rural and urban environment Johnson and Mann Running Waters I-C-E 120 MA 5 Fresh water and Man I-C-E 130 Mc6 Audio-Visual: Life Along the Waterways (color) 11 min. BAVI $ 3.50 Water (9 min.) $2.00 BAVI Community: DNR representative - someone who trout fishes	I. (Continued) E. Use the film The Stream f 1. Compare the stream the measured with the stream i 2. Which could support lif

Continued and Additional Suggested Learning Experiences

I. (Continued)

E. Use the film The Stream from I-C-E RMC
1. Compare the stream the students visited and measured with the stream in the film.
2. Which could support life more easily?

CONCEPT

5. An adequate supply of clean air is essential because most organisms depend on oxygen, through respiration, to release the energy in their food.

Discipline Area Math

Subject Orde

Problem Orientation Ai

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING
Cognitive: The student will collect different samples of air pollution and place the samples in order of smallest to greatest. Affective: The student will propose different ways to cut down on air pollution. Skills to be Learned Collecting Comparing Discussion	I. Student-Centered in class activity A. Air filter activity 1. Make a device to collect air pollution samples. Get a vacuum cleaner and some filter paper a little bigger than the end of the hose Fold it down and put a rubber band over the filter to hold it down. 2. Collect pollutants in different places. (New filter for each) a. Inside house b. Outside house c. In school d. In industrial area e. In one place at different times of day. f. Exhaust from car. (stand at side of auto so you don't breathe CO g. Use different cars, trucks, motorcycles etc. 3. Compare all filter and place in order from very (continued on reverse side)

Discipline Area Mathematics

Subject Order of Numbers

Problem Orientation Air quality control Grade 2

SUGGESTED LEARNING EXPERIENCES

t-Centered in class
ty

ilter activity
e a device to col-
t air pollution
s. Get a vacuum
r and some filter
a little bigger
he end of the hose
t down and put a
band over the filter
d it down.
lect pollutants in
ent places. (New
for each)
side house
tside house
school
industrial area
one place at dif-
t times of day.
haust from car.
d at side of auto
u don't breathe CO
e different cars,
s, motorcycles etc.
pare all filter and
in order from very
nued on reverse side)

II. Outside Resource and Community Activities

A. Cars, trucks, and other motor vehicles of the children's parents.

B. Industrial area - collect air samples from different places within the area and run the test as before.

Resource and Reference Materials	Continued and Additional Sugg
Publications: Air Pollution Lavaroni and O'Donnel Addison-Wesley Pub. Co. at I-C-E Clean Air for Your Community Environmental Health Services I-C-E Vertical File Shuttlesworth, D.E. Clean Air, Sparkling Water the fight against Pollution, Doubleday 1968 $ 3.95 Audio-Visual: Filmstrips I-C-E Ward's Natural Science Establishment Environmental Pollution Our World in Crisis at I-C-E FS Stl Community: Auto mechanic to talk on how to cut down air pollution from cars.	I. Continued 3. light to very dark. Numb 4. Discuss filters. Teacher Which is the worse pollu How can air pollution be

inued and Additional Suggested Learning Experiences

ntinued

light to very dark. Number from 1 to 7.
Discuss filters. Teacher ask question such as:
Which is the worse pollutor one or two? Why?
How can air pollution be cut down in some areas?

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 6. Natural resources are not equally distributed over the earth or over time and greatly affect the geographic conditions and quality of life.

Discipline Area Mathe

Subject Count

Problem Orientation C

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING	II
Cognitive: The student will count the number of seeds that develop on a dandelion flower. Affective: The student will recommend ways to prevent the rapid growth of dandelions. Skills to be Learned Counting Comparing	I. Student-Centered in class activity A. Dandelion Seed Count 1. Collect a number of dandelions that have gone to seed. Collect several by putting a small bag over the flower and grasping the bag around the flower stem. Count the seed of at least 10 flowers. Teacher find the average number of seeds on a flower. Estimate the number of seed in the lawn area. *2. Germination test of dandelions. Count some seeds and plant them in pots. It will take several weeks for them to germinate. How many of them germinate? 3. Make a list of why some seeds do not grow. (birds, paved areas etc.) 4. Find out where dandelions grow. * list numbers planted compared to numbers that grew.	

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or over
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lity of

Discipline Area Mathematics

Subject Counting

Problem Orientation Green Areas Grade 2

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. Dandelion Seed Count

1. Collect a number of dandelions that have gone to seed. Collect several by putting a small bag over the flower and grasping the bag around the flower stem. Count the seed of at least 10 flowers. Teacher find the average number of seeds on a flower. Estimate the number of seed in the lawn area.

*2. Germination test of dandelions. Count some seeds and plant them in pots. It will take several weeks for them to germinate. How many of them germinate?

3. Make a list of why some seeds do not grow. (birds, paved areas etc.)

4. Find out where dandelions grow.

* list numbers planted compared to numbers that grew.

II. Outside Resource and Community Activities

A. Lawn or grassy area.

B. Compare the dandelions in lawn with those in a weedlot.

Resource and Reference Materials	Continued and Additional S
Publications: Kit: Investigations in Ecology Schultz and Marcuccio. Project I-C-E RMC Audio-Visual: Film Nature's Half Acre (33 min) color Project I-C-E RMC Film 210 Community: Gardener - speak on how he fights a dandelion problem.	

ued and Additional Suggested Learning Experiences

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 7. Factors such as facilitating transportation, economic conditions, population growth, and increased leisure time have a great influence on changes in land use and centers of population density.

Discipline Area Mather

Subject Area a

Problem Orientation Land

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPE	
Cognitive: The student will count the number of people in area and compare the number of people to the number of houses. Affective: The children will attempt to find new and better use of land space Skills to be Learned Census - Counting Research	I. Student-Centered in class activity A. Take a given area in classroom and mark off. In this area place a box shaped for a small house. Tell children that only two people live in the house and there is only that much room. Each day the teacher add a new item that will require more area on the given lot. (car-garage) (more money bigger house) (children - more rooms) (recreation room) children should see that the same area supports more buildings and people. B. Each child should ask parents how big a lot they live on. C. Take a census on each home finding these things: 1. number of rooms 2. number of people. 3. size of garage (1 or 2 car.) D. Have children count the number of houses and people in their block or area.	II. C C A. to num men

ing Discipline Area Mathematics

ditions, Subject Area and Counting

ased Problem Orientation Land Use Grade 2

fluence on

ers of population density.

SUGGESTED LEARNING EXPERIENCES

. Student-Centered in class activity

. Take a given area in classroom and mark off. In this area place a box shaped for a small house. Tell children that only two people live in the house and there is only that much room. Each day the teacher add a new item that will require more area on the given lot. (car-garage) (more money bigger house) (children - more rooms) (recreation room) children should see that the same area supports more buildings and people.

. Each child should ask parents how big a lot they live on.

. Take a census on each home finding these things:
1. number of rooms
2. number of people.
3. size of garage (1 or 2 car.)

. Have children count the number of houses and people in their block or area.

II. Outside Resource and Community Activities

A. Visit an apartment building to see how space is used and number of people in the apartment.

Resource and Reference Materials	Continued and Additional Su
Publications: Ecology; The City at I-C-E RMC 130 Mc 10 Community Planning at I-C-E 110 GI Ecolab at I-C-E Kit 21 Audio-Visual: Cities are Different and Alike BAVI The City BAVI Community: Real Estate Agency	

ls	Continued and Additional Suggested Learning Experiences
C	

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT		
	8. Cultural, economic, social, and political factors determine status of man's values and attitudes toward his environment.	Disci Subje Probl

BEHAVIORAL OBJECTIVES	SU
Cognitive: The learner will add and subtract as he plays the ecology game. Affective: The learner will suggest ways of achieving a clean world Skills to be Learned 1. Number line 2. Forward movement 3. Backward movement	I. Student-Centere activity A. Use a number 10. 1. Make sure t are familiar w line. 2. Use the cha the idea of mo ber line. 3. You can imp chart accordin 4. A forward d could be a res itive ecologic Reverse direct be a result of ecological act B. Use the game o page. 1. Make a game every 4 studen 2. You will ne place markers 3.You will nee and negative c points for eco tions. (continued on

social,

determine

and atti-

onment.

Discipline Area Mathematics

Subject Addition and Subtraction

Problem Orientation Quality of Life Grade 2

S	SUGGESTED LEARNING EXPERIENCES	
	I. Student-Centered in class activity A. Use a number line from 1 - 10. 1. Make sure the students are familiar with a number line. 2. Use the chart to get the idea of movement number line. 3. You can improvise on the chart according to need. 4. A forward direction could be a result of positive ecological action. Reverse direction could be a result of negative ecological action. B. Use the game on the next page. 1. Make a game board for every 4 students. 2. You will need dice and place markers for each team. 3.You will need positive and negative cards with points for ecological actions. (continued on reverse side)	II. Outside Resource and Community Activities A. Ask a street cleaner to keep track of the amounts he cleans off the street for about a week in terms of increase or decrease of amounts. Use the information and apply to the numberline.

Resource and Reference Materials

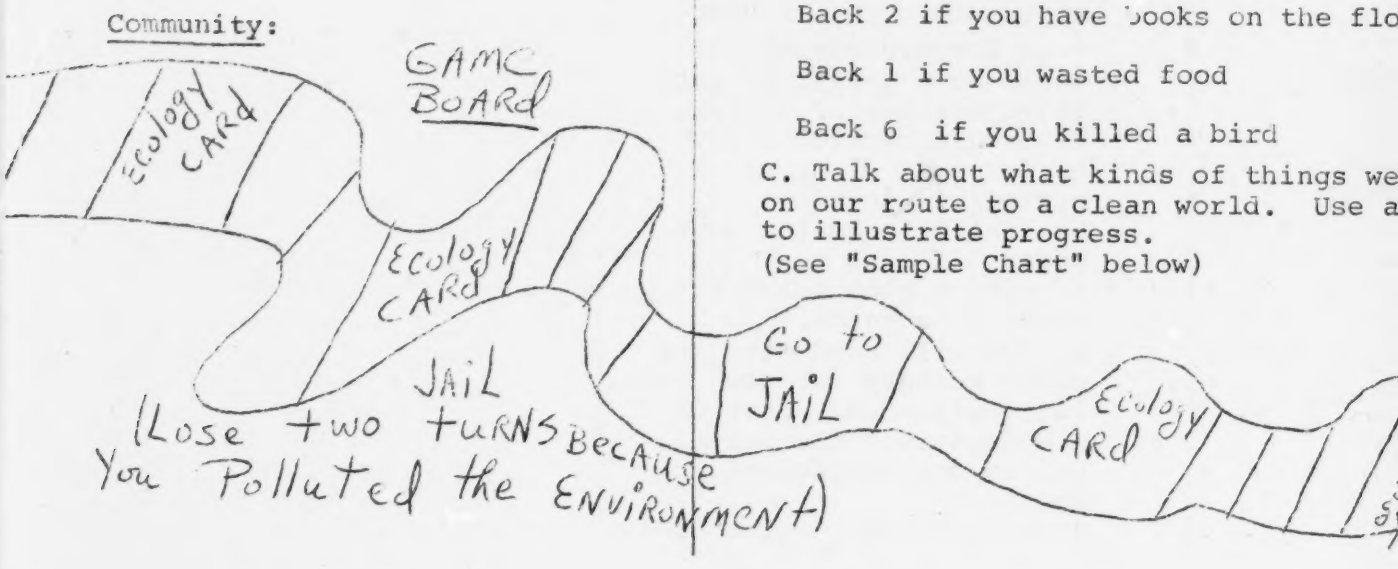
Publications:

Ecology the City 130 Mc10
I-C-E
The Environmental School
I-C-E 120 Me CB

Audio-Visual:

Our Land Needs your help BAVI
Nature is for People BAVI
Lakes BAVI

Community:



Continued and Additional Suggested Le

I(continued)

4. Roll the dice and go the number
roll. Do what the square tells you.
5. The winner is the person who get
first.
6. Discuss how many people fluctuat
and attitudes toward environment.

Sample Cards:

Forward 2 if you pick up paper in t

Forward 4 if you walked to school

Forward 1 if you turned off a light

Back 3 if you burned garbage this w

Back 2 if you have books on the flo

Back 1 if you wasted food

Back 6 if you killed a bird

C. Talk about what kinds of things we
on our route to a clean world. Use a
to illustrate progress.
(See "Sample Chart" below)

ontinued and Additional Suggested Learning Experiences

(continued)

4. Roll the dice and go the number of spaces you roll. Do what the square tells you.
5. The winner is the person who gets to Clean World first.
6. Discuss how many people fluctuate on their values and attitudes toward environment.

Sample Cards:

Forward 2 if you pick up paper in the room.

Forward 4 if you walked to school

Forward 1 if you turned off a light

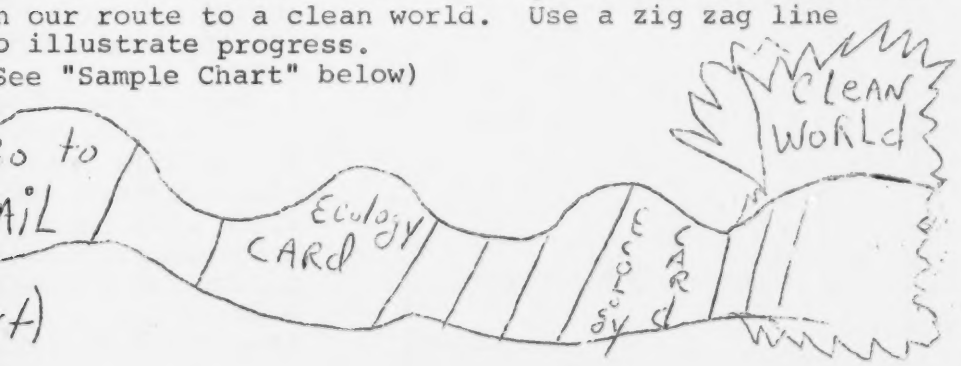
Back 3 if you burned garbage this week

Back 2 if you have books on the floor

Back 1 if you wasted food

Back 6 if you killed a bird

. Talk about what kinds of things we do back and forth n our route to a clean world. Use a zig zag line o illustrate progress.
See "Sample Chart" below)



CONCEPT

9. Man has the ability to manage, manipulate, and change his environment

Disciplin

Subject

Problem C

BEHAVIORAL OBJECTIVES	SUGGESTE
Cognitive: The student will make a picture of a city's skyline using the basic geometric shapes. Affective: The student will investigate the shapes that make all buildings. Skills to be Learned Observation Making squares, triangles, circles, and rectangles Discussion	I. Student-Centered in Activity A. Discuss basic geom shapes- squares, tria Circles, and rectangl B. Field trip of city skyline. Note and rec basic shapes that mak buildings of a city. C. In school each stud make a picture of the using the basic geomet shapes. D. Discuss one buildin it lends itself to th all view of the city.

ity to manage,

nge his

Discipline Area Mathematics

Subject Geometry - shapes

Problem Orientation Urban Environment Grade 2

os,

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class Activity

A. Discuss basic geometric shapes- squares, triangles, Circles, and rectangles.
B. Field trip of city to see skyline. Note and record the basic shapes that make up the buildings of a city.
C. In school each student make a picture of the city using the basic geometric shapes.
D. Discuss one building as it lends itself to the over all view of the city.

II. Outside Resource and Community Activities

A. Field trip to see the skyline of the city, or a nearby village.
B. Construct from boxes heights, sizes, and shapes of buildings.

Resource and Reference Materials	Continued and Additional Suggested Lea
Publications: Ecology - The City I-C-E RMC 130 M40 Ecolab Kit 21 I-C-E RMC Audio-Visual: Pictures of Buildings "Cities are different and alike" BAVI "The City" BAVI Community: Carpenter	

tinued and Additional Suggested Learning Experiences

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT: 10. Short-term economic gains may produce long-term environmental losses.

Discipline Area: Mathema

Subject: Subtrac

Problem Orientation: Wa

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EX	II.
Cognitive: The child will, through actual measurement, determine the amount of water wasted by one dripping faucet in a given period and compare water wasted in different faucets. Affective: The child will attempt to correct leaking faucets in his home through pressuring parents. Skills to be Learned 1. Observation 2. Comparison 3. Subtraction	I. Student-Centered in class activity A. Dripping faucets send clean, usable water into the sewers. 1. If you have a leaky faucet at home or in school find out the volume of water wasted in 24 hours. 2. Find the total number of leaky faucets in school and in all the homes of the students and the teacher. Together find the total waste of water if each wasted the same volume. B. Problems to be worked 1. Mary's leaky faucets wasted 15 cups of water a day. John's leaky faucets wasted only 6 cups a day. How much less water was wasted in John's home? 2. After Tom fixed the leaky faucet, it only dripped 1 cup a day. Before it was fixed it dripped 11 cups a day. How much did he save? (continued on reverse side)	A. ex co an wa B. to th wa th

gains may

onmental

Discipline Area Mathematics

Subject Subtraction

Problem Orientation Water Quality control Grade 2

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. Dripping faucets send clean, usable water into the sewers.

1. If you have a leaky faucet at home or in school find out the volume of water wasted in 24 hours.
2. Find the total number of leaky faucets in school and in all the homes of the students and the teacher. Together find the total waste of water if each wasted the same volume.

B. Problems to be worked

1. Mary's leaky faucets wasted 15 cups of water a day. John's leaky faucets wasted only 6 cups a day. How much less water was wasted in John's home?
2. After Tom fixed the leaky faucet, it only dripped 1 cup a day. Before it was fixed it dripped 11 cups a day. How much did he save?

(continued on reverse side)

II. Outside Resource and Community Activities

A. Municipal water worker to explain the importance of conserving water supply and the effects of wasted water.

B. Fire department employee to talk to pupils about the importance of a sufficient water supply for fire needs of the community.

Resource and Reference Materials	Continued and Additional Suggested Le
Publications: Kit Investigations in Ecology card number 10 , Leaky Faucets Project I-C-E RMC The Magic of Water Charles Scribner and Sons The First Book of Water Audio-Visual: How Water Helps Us IMC BAVI F 181-D Community: City Water Department City Fire Department The Homes	3. During one day Bob used water five he wasted 4 cups, the next two times the 4th time he wasted 6 cups, the la 8 cups. How many cups of water did he 4. If Mary uses 30 gallons of water i Barb uses 42 gallons in one day. Who How much more? 5. If John forgot to shut off the wat getting a drink. How much water would if 8 gallons of water came out of the

Continued and Additional Suggested Learning Experiences

3. During one day Bob used water five times. The 1st time he wasted 4 cups, the next two times he wasted 5 cups, the 4th time he wasted 6 cups, the last time he wasted 8 cups. How many cups of water did he waste?
4. If Mary uses 30 gallons of water in one day and Barb uses 42 gallons in one day. Who uses more water? How much more?
5. If John forgot to shut off the water tap after getting a drink. How much water would he waste in 3 hours if 8 gallons of water came out of the tap every hour?

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 11. Individual acts, duplicated or compounded, produce significant environmental alterations over time.

Discipline Area Mathematics

Subject Computation

Problem Orientation Litter

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIE	
Cognitive: The learner will add weights of litter. Affective: The learner will support a campaign for individual responsibility to cut litter accumulation. Skills to be Learned Computation Weighing Observing Keeping records	I. Student-Centered in class activity A. You will try to determine the number of returnable or recyclable containers used at home. 1. Discuss re-usable containers and containers that must be thrown out. 2. Count homes who use milk bottles, juice bottles, pop bottles, and plastic containers. 3. Have a campaign to return and make money with the returnable bottles. 4. Tally the returnable and non-returnable containers. B. Ask students to pick up cans and litter. 1. Add these 1 by 1 to determine effects. 2. Calculate total weight. C. Clean the desk and find the height of a pile of waste paper. 1. Individual piles 2. group pile. (continued on reverse side)	II. Outsi Commu A. take area to piling u B. Each at home and bott and disc and mont school. C. Locat area and litter. Keep rec for a pe

duplicated

ce signifi-

lterations

Discipline Area Mathematics

Subject Computation

Problem Orientation Litter Grade 2

ES

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. You will try to determine the number of returnable or recyclable containers used at home.
1. Discuss re-usable containers and containers that must be thrown out.
2. Count homes who use milk bottles, juice bottles, pop bottles, and plastic containers.
3. Have a campaign to return and make money with the returnable bottles.
4. Tally the returnable and non-returnable containers.

B. Ask students to pick up cans and litter.
1. Add these 1 by 1 to determine effects.
2. Calculate total weight.

C. Clean the desk and find the height of a pile of waste paper.
1. Individual piles
2. group pile.

(continued on reverse side)

II. Outside Resource and Community Activities

A. take a field trip to a dump area to see how much garbage is piling up.
B. Each child should observe at home how much paper, cans, and bottles the family uses and discards in a day, week, and month. Bring figures to school.
C. Locate a vacant lot or some area and note the amount of litter. Clean up and weigh. Keep record of litter amounts for a period of time.

Resource and Reference Materials	Continued and Additional Suggested Lea
Publications: Kit Looking into Life Systems and Man's Impact on Environment Card 13 Project I-C-E RMC	D. Discuss what happens when 1 person pared to 100 person. 1. Plan a campaign to make people mor responsibility to the environment.
Audio-Visual: Garbage at I-C-E 260 RMC 1370 Wealth of the Wasteland color 30 min. $2.00 BAVI 6366 What's Happening to our Landscape 20 min. BAVI Paper and I, 14 min. Southern Pulpwood Conservation Film Service Labs Jefferson Road Athens, Ga. 30601 Film: Litter -ly Speaking 14 min. New York State Dept. of Transportation 1220 Washington Avenue Albany, New York 12226 Film: The Litterbug color - 8 min. Walt Disney Productions Educational Film Div. 500 S. Buena Vista Avenue Burbank, Ca. 91503 Community: Vacant Lot Dump	

ıs	Continued and Additional Suggested Learning Experiences
	D. Discuss what happens when 1 person litters as compared to 100 person. 1. Plan a campaign to make people more conscious of their responsibility to the environment.

ESEA Title III 59-70-0135-2 Project I-C-E

CONCEPT 12. Private ownership must be regarded as a stewardship and should not encroach upon or violate the individual right of others.

Discipline Area Mathematics

Subject Subtraction

Problem Orientation Forests

BEHAVIORAL OBJECITVES	SUGGESTED LEARNING EXPERIE	
Cognitive: The learner will compute the effects of his behavior on a forest. Affective: The learner will offer suggestions as to how a forest can be cared for so that animal life is preserved Skills to be Learned 1. Even and odd numbers 2. Counting by 5 3. Subtracting 2 digit numbers. 4. One to one Correspondence 5. Interpretation	I. Student-Centered in class activity A. You will simulate a forest. 1. Each student will need 99 toothpicks for trees and 99 dots for birds and clay or styrofoam for ground. Put birds into the trees and the trees into the ground. 2. You sell 31 trees - how many trees are left? 3. What happens to the birds? 4. You plant 10 seedlings (broken toothpicks) Can birds live in seedlings? 5. The next year you sell 50 trees. How many big trees are left standing? 6. What happens to the birds? 7. You don't plant any more trees, but sell the rest of the big ones left. 8. What happens to the birds? 9. Discuss what resulted with your decision not to replant trees, but to continue selling (Continued on reverse side)	II. Outs Comm A. DNR of fo of an B. Mem Societ vironm life. C. Iden birds a tree

ship must be re-
rdship and should
or violate the
of others.

Discipline Area Mathematics

Subject Subtraction

Problem Orientation Forests Grade 2

CITVES	SUGGESTED LEARNING EXPERIENCES	
ner will of his . ner ns as be imal ers it pondence	I. Student-Centered in class activity A. You will simulate a forest. 1. Each student will need 99 toothpicks for trees and 99 dots for birds and clay or styrofoam for ground. Put birds into the trees and the trees into the ground. 2. You sell 31 trees - how many trees are left? 3. What happens to the birds? 4. You plant 10 seedlings (broken toothpicks) Can birds live in seedlings? 5. The next year you sell 50 trees. How many big trees are left standing? 6. What happens to the birds? 7. You don't plant any more trees, but sell the rest of the big ones left. 8. What happens to the birds? 9. Discuss what resulted with your decision not to replant trees, but to continue selling (Continued on reverse side)	II. Outside Resource and Community Activities A. DNR to speak on the effect of forest use and destruction of animals. B. Member of the Audobon Society to speak on the environment conducive to bird life. C. Identify and count the birds that interact with a tree in the school yard.

Resource and Reference Materials	Continued and Additional Suggested
Publications: Birds - Holt, Winston-Rinehart at I-C-E RMC Ecology - The Forest at I-C-E RMC Benziger 130 Mc Multiple - Use - Management at I-C-E 170 No. Audio-Visual: "Nature's Half Acre" Film 210 at I-C-E RMC "Our Natural Resources" BAVI Community: ONR Audobon Speaker	I. (continued) B. Using the forest again 1. Make a sheet with numbers from 1 2. Put this over the clay base and d est again. 3. Count by 5. Sell each tree that i Example: Tree number 5,10,15 etc. Ho 4. What should you do with the birds 5. Now sell off all odd numbered tre 6. What happens to the birds? 7. The remainder of the trees are in your campfire you left burning. 8. What happened to the birds? 9. Discuss the effects of your care What did you do to the birds.

Continued and Additional Suggested Learning Experiences

(continued)

B. Using the forest again

1. Make a sheet with numbers from 1 to 100
2. Put this over the clay base and discuss your new forest again.
3. Count by 5. Sell each tree that is on the number. Example: Tree number 5,10,15 etc. How many are left?
4. What should you do with the birds?
5. Now sell off all odd numbered trees. How many are left?
6. What happens to the birds?
7. The remainder of the trees are in a fire caused by your campfire you left burning.
8. What happened to the birds?
9. Discuss the effects of your care of the forest. What did you do to the birds.

PROJECT I-C-E Episode Evaluation Form (Reproduce

Please fill in:
Subject: _____

Grade: _____

Concept No. Used: _____

In commenting on each episode u
form. Feel free to adapt it and
your critiques and comments - neg
hand column, please rate (poor, g
make specific comments or suggest
vided to help us make this a more

Poor	Good	Exc.	
			I. Behavioral Objectives A. Cognitive:
			B. Affective:
			II. Skills Developed
			III. Suggested Learning Experiences A. In Class:
			B. Outside & Community Activities:
			IV. Suggested Resource & Reference Materials (specific suggestions & comments)

T I-C-E Episode Evaluation Form (Reproduce or duplicate as needed)

In commenting on each episode used in your class, please use this form. Feel free to adapt it and add more pages. Let us know all your critiques and comments - negative and positive. In the left-hand column, please rate (poor, good, excellent) each item. Also, make specific comments or suggestions if possible in the space provided to help us make this a more usable guide. Thank you.

. Behavioral Objectives
A. Cognitive:

B. Affective:

. Skills Developed

. Suggested Learning Experiences
A. In Class:

B. Outside & Community Activities:

. Suggested Resource & Reference Materials
(specific suggestions & comments)

Project I-C-E
Serving Schools in CESA 3-8-9
1927 Main Street
Green Bay, WI 54301

ED 079156

Project I - C - E INSTRUCTION - CURRICULUM - EN

A SUPPLEMENTARY PROGRAM FOR ENVIRONMENTAL EDUCATION

DISCIPLINE AREA Mathematics GRADE 3

Produced under Title III E.S.E.A.
PROJECT I-C-E
Serving Schools in CESA's 3-8-9
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Robert
Robert
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matics GRADE 3

II E.S.E.A.

A's 3-8-9

54301

468-7464)

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PREFACE

"Oikus" for house is the Greek origin of the term "ecology". E
studies our house--whatever or wherever it may be. Like an umbrel
expand or contract to fit many ranges--natural and man-made. We c
environments, our many "houses" if we omit rancor and cite long ra
complexities. Our "oikus" uses the insights of all subjects. Thu
multidisciplinary program like ours necessarily results. Also, si
a long time, our program ranges K thru 12. The environment mirror
values. These values have their origin in the "oikus" of our coll
minds. Let us become masters of our house by replacing the Greek
with "Know thyself and thine house."

1. Written and designed by your fellow teachers, this guide is sup
   to fit appropriately into existing, logical course content.
2. Each page or episode offers suggestions. Knowing your students
   to adapt or adopt. Limitless chances are here for your experim
   Many episodes are self contained, some open-minded, still other
   developed over a few days.
3. Try these episodes, but please pre-plan. Why? Simply, no guid
   and no curriculum will work unless viewed in the context of you
4. React to this guide with scratch ideas and notes on the episode
5. After using an episode, fill out the attached evaluation form i
   duplicate, or request more of these forms. Send them singly or
   We sincerely want your reactions or suggestions--negative and p
   evaluations are the key in telling us "what works" and in aidin
   the guides.

TERMS AND ABBREVIATIONS

ICE RMC is Project ICE Resource Materials Center serving all pub
school districts in CESA 3, 8, and 9. Check the Project ICE Bibli
resources. Our address and phone number is on this guide's cover.
or call us for any materials or help.

BAVI is Bureau of Audio Visual Instruction, 1327 University Aven
Madison, Wisconsin 53701 (Phone: 608-262-1644).

Cognitive means a measurable mental skill, ability, or process b
Affective refers to student attitudes, values, and feelings.

PREFACE

e is the Greek origin of the term "ecology". Environmental education
-whatever or wherever it may be. Like an umbrella, our house can
to fit many ranges--natural and man-made. We can add quality to our
any "houses" if we omit rancor and cite long range gains, costs, and
"oikus" uses the insights of all subjects. Thus, a rational, positive,
rogram like ours necessarily results. Also, since attitudes grow over
rogram ranges K thru 12. The environment mirrors our attitudes or
ues have their origin in the "oikus" of our collective and individual
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episode, fill out the attached evaluation form in the back. Use,
equest more of these forms. Send them singly or collectively to us.
nt your reactions or suggestions--negative and positive. Your
the key in telling us "what works" and in aiding our revisions of

ATIONS

et ICE Resource Materials Center serving all public and non-public
n CESA 3, 8, and 9. Check the Project ICE Bibliography of available
dress and phone number is on this guide's cover. Feel free to write
materials or help.
f Audio Visual Instruction, 1327 University Avenue, P. O. Box 2093,
53701 (Phone: 608-262-1644).
a measurable mental skill, ability, or process based on factual data.
to student attitudes, values, and feelings.

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Sister Lois Jonet, Holy Angels
Kenneth Kappell, St. Aloysius
Kenneth Keliher, Appleton
Everett Klinzing, New London
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Mae Rose LaPointe, St. John High
Rosemarie Lauer, Hortonville
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Harold Lindhorst, St. Martin (L)
Dennis Lord, Little Wolf
Robert Meyer, Neenah
Arnold Neuzil, Shiocton
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Gladys Roland, Little Wolf
Kathryn Rowe, Appleton
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Lee Smoll, Little Chute
Doris Stehr, Mt. Calvary (L)
Ginger Stuvetraa, Oshkosh
Richard Switzer, Little Chute
Tim Van Susteren, Holy Name
Lila Wertsch, St. Margaret Mary
Warren Wolf, Kimberly
Gery Farrell, Menasha

Peter Bi
Lee Clase
Kathryn
Merle Col
Sara Curt
Duane Del
Roberta
Janet Eli
Phyllis
Keith Faw
Jack Giac
Mike Glef
Herbert
Gary Heil
Nannette
Joseph Hu
Catherine
DeAnna Jo
Kris Karp
Mel Kasen
Jack Koiv
Sister Ma
Ellen Lot
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, St. Martin (L)	Mel Kasen, Gibraltar
tle Wolf	Jack Koivisto, Green Bay
enah	Sister Mary Alyce, Cathedral
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ourdes	Judilyn McGowan, Green Bay
St. Martin (L)	Priscilla Mereness, Wrightstown
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ittle Wolf	Roger Roznowski, Southern Door
pleton	Jan Serrahn, Sevastopol
uer, Menasha	Calvin Siegrist, How.-Suam.
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, Oshkosh	
Little Chute	
, Holy Name	
. Margaret Mary	
berly	
nasha	

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 1. Energy from the sun, the basic source of all energy, is converted through plant photosynthesis into a form all living things can use for life processes.

Discipline Area Mathemati

Subject Numeratio

Problem Orientation Ecologica

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERI	
Cognitive: The child will measure the number of days a plant can live without sunlight. Affective: The child will demonstrate that plants need sunlight in order to live and grow. Skills to be Learned Observation Problem Solving Recording Investigating Experimentation Measuring - inches and meters	I. Student-Centered in class activity A. The class will find the answer to the following questions. 1. How long can a plant live without sunlight? Compute the number of days. 2, What happens to a plant that receives no energy from the sun. B. The class will demonstrate how long it takes a plant to die when it is deprived of sunlight, compute days and hours. 1. Place plant in dark place without sunlight. 2. Water plant regularly. 3. See that there is sufficient oxygen. 4. Class count the number of days until change takes place in the plant. 5. Record change in color, texture and vitality of plant. (continued on reverse side)	II. Outs Commu A. Invi to clas on plan 1. He many per s B. Visi to see live i light. C. In greenh to dete the mos much m D. They the gre light How ma E. Flo the eff sunligh

Discipline Area Mathematics

Subject Numeration

Problem Orientation Ecological Cycles Grade 3

for life processes.

SUGGESTED LEARNING EXPERIENCES

udent-Centered in class
tivity

The class will find the
wer to the following ques-
ns.
How long can a plant
ve without sunlight?
mpute the number of days.
What happens to a
ant that receives no en-
gy from the sun.
The class will demonstrate
long it takes a plant
die when it is deprived of
light, compute days and
rs.
Place plant in dark place
thout sunlight.
Water plant regularly.
See that there is suf-
cient oxygen.
Class count the number of
ys until change takes place
the plant.
Record change in color,
xture and vitality of plant.
ontinued on reverse side)

II. Outside Resource and Community Activities

A. Invite florist to speak to class on effect of sunlight on plants in a greenhouse.
1. He will tell class how many plants can be served per square foot of sunlight.
B. Visit to a greenhouse to see how many plants can live in a given area of sunlight.
C. In small groups at the greenhouse students will try to determine which plants need the most sunlight and how much more.
D. They will find out how the greenhouse supplies sunlight on cloudy days.
How many hours per year?
E. Florist will demonstrate the effect of too little sunlight on plants.

Resource and Reference Materials	Continued and Additional Sug
Publications: McDonald, Char and Earnest Study in Plant Succession from VF at Project I-C-E RMC 110 SA Living Things in Field and Classroom - I-C-E RMC "People and their Environment" Teachers' Curriculum Guide to Conservation Education I-C-E 170 Lr. RMC	I. Continued C. Children will show actua growth that has been depriv with one that receives an a measurement in inches or me D. Children will find out t some plants need more sunli more do they need? Subtract
Audio-Visual: 6743 Green Plants and Sun- light BAVI 5732 Sun: Friend or Foe? 11 min. $4.50 BAVI 1969	
Community: Greenhouse Florist Gardens	

ntinued and Additional Suggested Learning Experiences

Continued

. Children will show actual difference in a plant's rowth that has been deprived of sunlight. Compared ith one that receives an adequate supply by daily easurement in inches or meters.

. Children will find out through experimentation that ome plants need more sunlight than others. How much ore do they need? Subtract number of days needed.

CONCEPT 2. All living organisms interact among themselves and their environment, forming an intricate unit called an ecosystem.

Discipline Area Mat

Subject Mul

Problem Orientation L

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNIN
Cognitive: The learner will calculate the increase or decrease of population within an ecosystem. Affective: The learner will propose ways to preserve different ecosystems. Skills to be Learned 1. digit multiplication 2. addition 3. subtraction 4. interpretation	I. Student-Centered in class activity A. The student is given an ecosystem to work with. 1. Give a detailed list and numbers of the items in the ecosystem. In a pond: cattails 10 crayfish 32 bullheads 24 frogs 16 algae 1,750,652 water bugs 127 2. Create problems which indicate either multiplication of the plant and animal population or decrease of the population. a. On a warm day the algae multiplied and 2,220,443 new algae were made. How many do you have now? What will this do to the pond? b. Twelve frogs laid eggs. Of all the eggs laid 7 from each frog grew into tadpoles and young frogs. How many frogs are in the pond (continued on reverse side)

act

Discipline Area Mathematics

Subject Multiplication

te

Problem Orientation Life Cycles Grade 3

SUGGESTED LEARNING EXPERIENCES

Student-Centered in class activity

. The student is given an cosystem to work with.

. Give a detailed list and umbers of the items in the cosystem. In a pond:

cattails	10
crayfish	32
bullheads	24
frogs	16
algae	1,750,652
water bugs	127

. Create problems which in- licate either multiplication f the plant and animal opulation or decrease of he population.

a. On a warm day the algae multiplied and 2,220,443 new algae were made. How many do you have now? What will this do to the pond?

b. Twelve frogs laid eggs. Of all the eggs laid 7 from each frog grew into tadpoles and young frogs. How many frogs are in the pond

(continued on reverse side)

II. Outside Resource and Community Activities

A. Have a DNR representative speak on the establishment of a pond.

B. Visit a pond in the area Do actual counting of members in the pond.

Resource and Reference Materials

Publications:

Ecology - Fresh Waters and Man at I-C-E RMC

Ecolab Kit 21
SCIS Organisms 110 CA
SCIS Environments 110 LA
SCIS Life Cycles 110 BU

Audio-Visual:

"Nature's Half Acre" FM 210 at I
I-C-E RMC
"Life in a Pond" BAVI
"Life in an Aquarium" BAVI

Community:
DNR representative

Continued and Additional Sugg

I. continued

b. now? What does this do
c. The farmer sprayed his
bugs died. How many bugs w
do to the pond.

B. Play Web Game
1. Put the names of members
paper. You will need yarn.
2. Give the students each a
(frog, water bug, etc) Then
The yarn gets passed to som
first member.
3. Continue passing until t
4. One member drops out, Wh
5. Discuss interpendence in

ials	Continued and Additional Suggested Learning Experiences
an	I. continued b. now? What does this do to the pond? c. The farmer sprayed his field with DDT. 96% of the bugs died. How many bugs were left? What does this do to the pond. B. Play Web Game 1. Put the names of members of the ecosys em onto paper. You will need yarn. 2. Give the students each an identification card. (frog, water bug, etc) Then start the yarn at one member The yarn gets passed to something that affects the first member. 3. Continue passing until the web develops. 4. One member drops out, What happens? 5. Discuss interpendence in an ecosystem.
at I	

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT

3. Environmental factors are limiting on the numbers of organisms living within their influence, thus, each environment has a carrying capacity.

Discipline Area

Subject

Problem Orientation

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNI
Cognitive: The student will show, by multiplication, the total number of mice in three equal litters. Affective: By applying the principle of food control to three other living things the students will demonstrate an understanding that each environment has a carrying capacity. Skills to be Learned 1. Locating information in an encyclopedia. 2. Basic multiplication facts 3. Drawing inferences.	I. Student-Centered in class activity A. Students use an encyclopedia to find the average number of baby mice per litter. B. Using the above information work the following problems 1. How many babies will one mother mouse have in two different births? 2. How many babies will two mother mice have in two different births? C. Discuss. What would happen if the mice population would increase in this manner without anything stopping them? 1. Would this be true of any living thing? 2. What would prevent the mice from multiplying so rapidly? 3. What would happen to the mice if they multiplied so fast that they wouldn't have enough food?

rs are limit-

organisms

fluence, thus,

carrying capacity.

Discipline Area Mathematics

Subject Multiplication

Problem Orientation Population Growth Grade 3

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. Students use an encyclopedia to find the average number of baby mice per litter.

B. Using the above information work the following problems

1. How many babies will one mother mouse have in two different births?
2. How many babies will two mother mice have in two different births?

C. Discuss. What would happen if the mice population would increase in this manner without anything stopping them?

1. Would this be true of any living thing?
2. What would prevent the mice from multiplying so rapidly?
3. What would happen to the mice if they multiplied so fast that they wouldn't have enough food?

II. Outside Resource and Community Activities

A. Local fields (the habitat of field mice)

B. Local farms (barns for rats and mice)

C. Relate to Science class where they raise mice, gerbals etc.

Resource and Reference Materials	Continued and Additional Suggested Learn
Publications: 190 Kit Kimball, Richard, 1971 Too Many People, I-C-E RMC Ecology - Research in Science I-C-E RMC 1969 Ecology - McCue, George 130 Mc I-C-E Audio-Visual: Pet Gerbals McGraw Hill Study Pictures a. "Animal Disguises" b. "Pond Life" c. "Animal Babies" I-C-E RMC No. K-19 Community: 1. Have farmer come in to discuss the damage done on farms by rats and mice. 2. Have science student show live mice and rats to pupils so they recognize them.	

	Continued and Additional Suggested Learning Experiences

CONCEPT 4. An adequate supply of pure water is essential for life.

Discipline Area: Mathemati

Subject: Numeratio

Problem Orientation: Water Con

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERI	
Cognitive: The student will tabulate numbers and record the amount of water needed for daily living. Affective: The student will demonstrate a consciousness that water needs to be conserved for the future by showing how water is used. Skills to be Learned Observation Counting Discussion Listing Tabulating	I. Student-Centered in class activity A. The student will count and record the number of times he uses water in a day by measuring it in standard measurement. 1. Water used for drinking. 2. Water used for washing and bathing, tooth brushing, etc. 3. Water used in laundering 4. Water used in washing dishes and cleaning home. 5. Amount used in other ways by child. B. He will make a chart showing amount of water used daily, weekly and monthly by an individual in cups. C. Make chart showing where water comes from. D. After discussing how water could be saved, have child record and compare the amount of water used in brushing teeth at the beginning of the activity with amount used after	II. Outsi Commu A. Trip ment to is used B. Have conserva and demo water.

(continued

uate supply of pure

s essential for life.

Discipline Area Mathematics

Subject Numeration

Problem Orientation Water Consumption Grade 3

ORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
The student te numbers and mount of water daily living. The student trate a con- hat water conserved for y showing how ed. e Learned	I. Student-Centered in class activity A. The student will count and record the number of times he uses water in a day by measuring it in standard measurement. 1. Water used for drinking. 2. Water used for washing and bathing, tooth brushing, etc. 3. Water used in laundering 4. Water used in washing dishes and cleaning home. 5. Amount used in other ways by child. B. He will make a chart showing amount of water used daily, weekly and monthly by an individual in cups. C. Make chart showing where water comes from. D. After discussing how water could be saved, have child record and compare the amount of water used in brushing teeth at the beginning of the activity with amount used after	II. Outside Resource and Community Activities A. Trip to local water department to learn about how water is used by the community. B. Have representative of conservation department talk and demonstrate ways to save water.

(continued on reverse side)

Resource and Reference Materials	Continued and Additional Suggeste
Publications: Running Water at I-C-E RMC 120 MA 5 Story of Water Supply (Free in quantities of 35) (comic book type) Menasha Electric and Water Utilities P.O. Box 340 Menasha, Wisconsin Audio-Visual: City Water Supply $2.00 BAVI Water $2.00 BAVI Water Pollution $2.00 BAVI Community: City Water Department Conservation Department	I. continued D. Class discussion on conserv

ence Materials	Continued and Additional Suggested Learning Experiences
-C-E RMC ly (Free in comic book d Water 2.00 00 nt tment	I. continued D. Class discussion on conserving water.

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT

5. An adequate supply of clean air is essential because most organisms depend on oxygen, through respiration, to release the energy in their food.

Discipline Area

Subject

Problem Orientatio

BEHAVIORAL OBJECTIVES	SUGGESTED LEAR
Cognitive: The student will construct a simple vertical bar graph and through comparison be able to select the greatest offender in producing suspended particles. Affective: In a discussion the student will voluntarily suggest that something must be done about the problem of suspended particles. Skills to be Learned 1. Vertical bar graphs 2. Comparison 3. Drawing inferences	I. Student-Centered in class activity A. Suspended Particles 1. Teacher construct a set of six simple vertical bar graphs, numbering each from 0-50, on a master ditto and run off one for each student. 2. Have students fill in wit color and label each of the graphs using the following title, terms and numbers. Suspended Particles a. Industrial 45% b. Power Plants 28% c. Refuse disposal 9 % d. Residential 6 % e Industrial process 5% f Transportation 7% The percentage symbols are given for teacher benefit only. Not to be used on graphs. 3. Teacher may have to explain the above terms. (continued on reverse side)

n adequate supply of clean

ıs essential because most

ıisms depend on oxygen, through

ıration, to release the energy

ıeir food.

Discipline Area Mathematics

Subject Vertical bar graphs and comparison

Problem Orientation Air pollution Grade 3

AVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
ı: The student will a simple verti-graph and through on be able to ıe greatest offen- roducing suspended .	I. Student-Centered in class activity A. Suspended Particles 1. Teacher construct a set of six simple vertical bar graphs, numbering each from 0-50, on a master ditto and run off one for each student. 2. Have students fill in with color and label each of the graphs using the following title, terms and numbers. Suspended Particles a. Industrial 45% b. Power Plants 28% c. Refuse disposal 9 % d. Residential 6 % e Industrial process 5% f Transportation 7% The percentage symbols are given for teacher benefit only. Not to be used on graphs. 3. Teacher may have to explain the above terms. (continued on reverse side)	II. Outside Resource and Community Activities A. Observation of vehicles on streets and highways B. Invite city engineer to explain what is being done to control suspended particles. Have students check filters in air conditioners or furnaces in their own homes to see the amount of suspended particle accumulation that is filtered in their own homes.
: In a dis- he student ıntarily sug- something must bout the prob- spended parti-		
be Learned al bar graphs ison ıg inferences		

Resource and Reference Materials	Continued and Additional Suggested Learning E
Publications: Pollution - Problems Projects Wisconsin Dept. of public instruction I-C-E RMC Carr, Donald E. The Breath of Life Norton 1965 "Minnesota air quality Regulation" Metro Clean Air Committee 1829 Portland Avenue Minneapolis, Minnesota I-C-E RMC Audio-Visual: Teacher prepare a number of graphs on transparencies to show and use for discussion about the use of graphs. Community: City Engineer Sites of Local industry Streets and highways (vehicle observation) DNR official to discuss effects of pesticides on bird and animal life	I. continued 4. After graphs have been filled in have s comparisons. Examples follow: a. Which produces the most amount of sus cles. b. Which produces the least amount of su particles. c. Use questions involving greater than 5. Discuss briefly the harm to life caused ed particles. 6. Discuss what might be done to reduce th suspended particles and explain what is be

als	Continued and Additional Suggested Learning Experiences
ion"	I. continued 4. After graphs have been filled in have students make comparisons. Examples follow: a. Which produces the most amount of suspended particles. b. Which produces the least amount of suspended particles. c. Use questions involving greater than and less than. 5. Discuss briefly the harm to life caused by suspended particles. 6. Discuss what might be done to reduce the amount of suspended particles and explain what is being done.
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ts	

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 6. Natural resources are not equally distributed over the earth or over time and greatly affect the geographic conditions and quality of life.

Discipline Area Mathematics

Subject Problem Solv

Problem Orientation Resource U

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIEN	
Cognitive: Given a section of land with the amount of natural resources it contains the students will calculate the amount of time before resources are consumed. Affective: The student will become aware, through computating that our resources do not come from an endless supply! Skills to be Learned Basic Computations Problem Solving	I. Student-Centered in class activity A. Find out if every person uses five gallons of oil in one day, in a town of 100 people. 1. How long would it take to use the oil in a well that contains 4,000 gallons of oil. 2. 5,000 gallons. 3. 6,000 gallons. B. If the people in the town of 100 people each use 30 gallons of water per day. 1. How long will 6,000 gallons last? 2. 9,000 gallons? 3. 12,000 gallons? C. If a lake contains 1400lbs. of fish and each of 100 persons eats 2 lbs. of fish a week. How long will the fish supply last?	II. Outsid Commun A. Speake explain a program. 1. What things w a. fish b. pheas c. deer

ral resources are not

distributed over the earth

time and greatly affect the

nic conditions and quality of

Discipline Area Mathematics

Subject Problem Solving

Problem Orientation Resource Use Grade 3

ORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
Given a sec- with the amount resources it con- udents will cal- mount of time rces are con-	I. Student-Centered in class activity A. Find out if every person uses five gallons of oil in one day, in a town of 100 people. 1. How long would it take to use the oil in a well that contains 4,000 gallons of oil. 2. 5,000 gallons. 3. 6,000 gallons. B. If the people in the town of 100 people each use 30 gallons of water per day. 1. How long will 6,000 gallons last? 2. 9,000 gallons? 3. 12,000 gallons? C. If a lake contains 1400lbs. of fish and each of 100 persons eats 2 lbs. of fish a week. How long will the fish supply last?	II. Outside Resource and Community Activities A. Speaker from the DNR to explain a resource stocking program. 1. What would happen if some things were not restored. a. fish b. pheasants c. deer (re-routed)
The student aware, through that our re- ot come from upply.		
Learned ations ing		

Resource and Reference Materials	Continued and Additional Suggested Learnin
Publications: 170 American Petroleum Institute 1968 PC Conserving our Waters and Cleaning the Air. I-C-E RMC Audio-Visual: K1 "American Petroleum Institute" 1965 8"Conservation: A picture discussion Kit" I-C-E RMC Community: DNR representative	

Materials	Continued and Additional Suggested Learning Experiences
Institute	
s and RMC	
ure	

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CONCEPT 7. Factors such as facilitating transportation, economic conditions, population growth, and increased leisure time have a great influence on charges in land use and centers of population density.

Discipline Area Mathe

Subject Arith

Problem Orientation Pop but

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING E	II
Cognitive: After being given a class sheet pertaining to population, the students compute the population gain for each state from the years 1960-1975. Affective: By observing and discussing the results of the worksheet the students will realize some of the factors leading to and problems with population growth. Skills to be Learned Arithmetic computation skills: addition and subtraction involving borrowing Comparing size of numbers Analyzing data	I. Student-Centered in class activity A. Population sheet Teacher hand out sheet to students. Students compute the population gain for each state. A few problems could be done on board as examples. B. Other questions the teacher could have the students answer are as follows: 1. Which state had the most population in 1960? the least? 2. Most in 1975? least in 1975? 3. Which state's population increased the most? the least? 4. Did any state's population drop? Which one? 5. How much population gain did we have in Wisconsin? 6. List in order from largest to amallest the 10 states that had the biggest population increase. (continued on reverse side)	A g d m c c c B o a t a s s C d s p

as facilitating

economic conditions,

h, and increased

e a great influence

Discipline Area Mathematics

Subject Arithmetic Computation

Problem Orientation Population distribution and growth

Grade 3

nd use and centers of population density.

CTIVES	SUGGESTED LEARNING EXPERIENCES	
eing per-on, the e pop-ch state -1975.	I. Student-Centered in class activity A. Population sheet Teacher hand out sheet to students. Students compute the population gain for each state. A few problems could be done on board as examples. B. Other questions the teacher could have the students answer are as follows: 1. Which state had the most population in 1960? the least? 2. Most in 1975? least in 1975? 3. Which state's population increased the most? the least? 4. Did any state's population drop? Which one? 5. How much population gain did we have in Wisconsin? 6. List in order from largest to amallest the 10 states that had the biggest population increase. (continued on reverse side)	II. Outside Resource and Community Activities A. The students could be given two state maps for different years. From the maps they could be asked to calculate population increases or decreases for certain cities. B. Have the city's mayor, or some city official, give a talk on the city's history concerning such points as: population, land use, schools, parking lots, shopping centers, etc. C. Have the school principal discuss the origin of the school as pertaining to population growth.
rving results e stu-some of to and ation		
d ion d ng um-		

Resource and Reference Materials

Publications:

"Population Growth and America's Future" U.S. Government Printing Office

Audio-Visual:

1581 "Population Patterns in the U.S." (11 min); 1961 BAVI
6937 "Population Problem U.S.A. Seeds of Change" (30 min) 1967 BAVI

Community:

Talk by city official

Continued and Additional Suggested

I. continued

7. Name some reasons why a stat have increased.

POPULATION SHEET

State	1960 Population	Popu
Alabama	3,267,000	3,922
Alaska	226,000	328
Arizona	1,302,000	2,126
Arkansas	1,786,000	2,184
California	15,717,000	24,129
Colorado	1,754,000	2,340
Connecticut	2,535,000	3,397
Delaware	446,000	617
Florida	4,952,000	7,720
Georgia	3,943,000	5,142
Hawaii	633,000	812
Idaho	667,000	760
Illinois	10,081,000	11,840
Indiana	4,662,000	5,417
Iowa	2,758,000	2,807
Kansas	2,179,000	2,397
Kentucky	3,038,000	3,400
Louisiana	3,257,000	4,162
Maine	969,000	1,031
Maryland	3,101,000	4,359
Massachusetts	5,149,000	5,842
Michigan	7,823,000	9,259
Minnesota	3,414,000	3,905
Mississippi	2,178,000	2,560
Missouri	4,320,000	4,870
Montana	675,000	764
Nebraska	1,411,000	1,538

(continued on next page)

eference Materials	Continued and Additional Suggested Learning Experiences
owth and America's overnment Printing	I. continued 7. Name some reasons why a states population could have increased.
on Patterns in the 1961 BAVI or. Problem U.S.A. e" (30 min)	
fficial	

POPULATION SHEET

State	1960 Population	1975 Population	Population Gain 1960-1975
Alabama	3,267,000	3,922,000	
Alaska	226,000	328,000	
Arizona	1,302,000	2,126,000	
Arkansas	1,786,000	2,184,000	
California	15,717,000	24,129,000	
Colorado	1,754,000	2,340,000	
Connecticut	2,535,000	3,397,000	
Delaware	446,000	617,000	
Florida	4,952,000	7,720,000	
Georgia	3,943,000	5,142,000	
Hawaii	633,000	812,000	
Idaho	667,000	760,000	
Illinois	10,081,000	11,840,000	
Indiana	4,662,000	5,417,000	
Iowa	2,758,000	2,807,000	
Kansas	2,179,000	2,397,000	
Kentucky	3,038,000	3,400,000	
Louisiana	3,257,000	4,162,000	
Maine	969,000	1,031,000	
Maryland	3,101,000	4,359,000	
Massachusetts	5,149,000	5,842,000	
Michigan	7,823,000	9,259,000	
Minnesota	3,414,000	3,905,000	
Mississippi	2,178,000	2,560,000	
Missouri	4,320,000	4,870,000	
Montana	675,000	764,000	
Nebraska	1,411,000	1,538,000	

(continued on next page)

POPULATION SHEET (Continued)

State	1960 Population	1975 Population	Popul 196
Nevada	285,000	632,000	
New Hampshire	607,000	800,000	
New Jersey	6,067,000	8,156,000	
New Mexico	951,000	1,215,000	
New York	16,782,000	20,450,000	
North Carolina	4,556,000	5,596,000	
North Dakota	632,000	677,000	
Ohio	9,706,000	11,461,000	
Oklahoma	2,328,000	2,655,000	
Oregon	1,769,000	2,239,000	
Pennsylvania	11,319,000	12,141,000	
Rhode Island	859,000	959,000	
South Carolina	2,383,000	2,865,000	
South Dakota	681,000	702,000	
Tennessee	3,567,000	4,345,000	
Texas	9,580,000	12,482,000	
Utah	891,000	1,207,000	
Vermont	390,000	441,000	
Virginia	3,967,000	5,243,000	
Washington	2,853,000	3,304,000	
West Virginia	1,860,000	1,755,000	
Wisconsin	3,952,000	4,557,000	
Wyoming	330,000	354,000	

POPULATION SHEET (Continued)

	1960 Population	1975 Population	Population Gain 1960-1975
	285,000	632,000	
re	607,000	800,000	
	6,067,000	8,156,000	
	951,000	1,215,000	
	16,782,000	20,450,000	
ina	4,556,000	5,596,000	
a	632,000	677,000	
	9,706,000	11,461,000	
	2,328,000	2,655,000	
	1,769,000	2,239,000	
a	11,319,000	12,141,000	
	859,000	959,000	
na	2,383,000	2,865,000	
	681,000	702,000	
	3,567,000	4,345,000	
	9,580,000	12,482,000	
	891,000	1,207,000	
	390,000	441,000	
	3,967,000	5,243,000	
	2,853,000	3,304,000	
a	1,860,000	1,755,000	
	3,952,000	4,557,000	
	330,000	354,000	

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 8. Cultural, economic, social, and political factors determine status of man's values and attitudes toward his environment.

Discipline Area Mathematics

Subject Charts and

Problem Orientation Noise Po

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPER	
Cognitive: The student will detect man's monetary values and attitudes toward his environment by tabulating a poll chart. Affective: The student will actively participate in composing a letter to a manufacturer offering some concrete suggestions based upon conclusions drawn from the poll chart. Skills to be Learned 1. Charts 2. Tabulations 3. Drawing influences 4. Drawing conclusions 5. Polling	I. Student-Centered in class activity A. Make plans to poll two mothers per pupil and plan so there will be no duplication of households. Use these questions or a set of your own that would be relevant to your community. 1. Would you be willing to pay $99.00 for a less noisy vacuum cleaner if the same model, but noiser was available for $90.00? 2. Would you be willing to pay $1.25 more for a less noisy hair dryer? 3. Would you be willing to pay $5.00 more for a less noisy lawn mower? B. Tabulate your results on a chart recording yes, no, and undecided responses. C. If you can come to any conclusions that might influence a manufacturer, have pupils compose a letter explaining what you have done and offer some concrete suggestions to him for future	II. Outs Comm A. Poll electri for the purchase applianc ed in th B. Make various cluding 1. Comp using than, a tions.

(continued on

economic, social,	Discipline Area	Mathematics
l factors determine	Subject	Charts and Tabulation
n's values and atti-	Problem Orientation	Noise Pollution Grade 3
his environment.		

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
student 's monetary tudes toward by tabula- rt.	I. Student-Centered in class activity A. Make plans to poll two mothers per pupil and plan so there will be no duplication of households. Use these questions or a set of your own that would be relevant to your community. 1. Would you be willing to pay $99.00 for a less noisy vacuum cleaner if the same model, but noiser was available for $90.00? 2. Would you be willing to pay $1.25 more for a less noisy hair dryer? 3. Would you be willing to pay $5.00 more for a less noisy lawn mower? B. Tabulate your results on a chart recording yes,no, and undecided responses. C. If you can come to any conclusions that might influence a manufacturer, have pupils compose a letter explaining what you have done and offer some concrete suggestions to him for future	II. Outside resource and Community Activities A. Poll local hardware or electric appliance dealers for the kinds of appliances purchased limiting the appliances to the 3 mentioned in the chart. B. Make tape recordings of various noise producers including those in the chart. 1. Compare noise output using greater than, less than, and equal to, questions.
student rticipate etter to ffering ggestions usions oll chart.		
rned		
ences usions		

(continued on reverse side)

Resource and Reference Materials	Continued and Additional Suggeste
Publicaitons: Sound and Silence VF I-C-E RMC Noise Pollution O'Donnell and Lavaroni, Addison and Wesley Audio-Visual: 1 7550 Noise (film) color 10 min. $4.75 BAVI 1970 3973 Noise is Pollution, Too (film) 12 min. $5.75 BAVI Magazine pictures of noise producers. Community: Local library for other publications on noise pollution. County or city nurse to discuss effects of noise pollution on hearing.	I. Continued C. production plans. D. Have city or county nurse ta of noise pollution on hearing. Sounds in our Environment Keep a record and compare Indoors What produced the sound / Sound Description / No sour hear _____ _____ ____ _____ _____ ____ _____ _____ ____ Outdoors _____ _____ ____ _____ _____ ____ 1. Using this same outline, go night and listen for 15 minutes and compare to sounds heard in 2. Do further research to learn body's functioning. 3. Do some research on the topi and how it affects human beings sources of noise pollution in y suggestions for the elimination be harmful.

aterials	Continued and Additional Suggested Learning Experiences

I. Continued
C. production plans.
D. Have city or county nurse talk about the effects of noise pollution on hearing.

Sounds in our Environment (Resource Sheet)

Keep a record and compare (15 min.)

		Indoors		
What produced the sound	Sound Description	No of times sound was heard	Was it loud or soft?	Pleasant or unpleasant
		Outdoors		

1. Using this same outline, go outside your home at night and listen for 15 minutes. Record your findings and compare to sounds heard in the daytime.
2. Do further research to learn how sounds affect the body's functioning.
3. Do some research on the topic of "Noise pollution" and how it affects human beings. Identify the main sources of noise pollution in your community. Make suggestions for the elimination of noises which may be harmful.

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 9. Man has the ability to manage, manipulate, and change his environment.

Discipline Area

Subject

Problem Orienta

BEHAVIORAL OBJECTIVES	SUGGESTED LE
Cognitive: The student will be able to compare the amount of litter in different environments by counting the number of pieces of litter in each environment. Affective: The students will realize that by littering he adversely affects and changes his environment. Skills to be Learned Counting Tabulation with fractions Compiling data	I. Student-Centered in clas activity A. Each student will count the pieces of litter in the classroom, school yard, and school halls. 1. With the above informa- tion the student will make list of the different type of litter, the number of pieces of each. The studen will make a circle and div the circle into sections. section will represent a type of litter the student found. The sections should vary in size according to the number of pieces of ea type of litter the student found. B. The students will tabula by rooms the amount of litt in waste baskets. Then they will indicate the amount of litter for each grade. C. Work out these problems. 1. Most Americans throw away about 5 pounds of trash a day. How many poun (continued on reverse side

nas the ability to manage,

ate, and change his en-

nt.

Discipline Area Mathematics

Subject Fractions

Problem Orientation Litter Grade 3

VIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
The student le to compare the litter in differ- nments by counting of pieces of lit- n environment.	I. Student-Centered in class activity A. Each student will count the pieces of litter in their classroom, school yard, and school halls. 1. With the above information the student will make a list of the different types of litter, the number of pieces of each. The student will make a circle and divide the circle into sections. Each section will represent a type of litter the students found. The sections should vary in size according to the number of pieces of each type of litter the students found. B. The students will tabulate by rooms the amount of litter in waste baskets. Then they will indicate the amount of litter for each grade. C. Work out these problems. 1. Most Americans throw away about 5 pounds of trash a day. How many pounds (continued on reverse side)	II. Outside Resource and Community Activities A. The students will take a litter count in their own yard and report to the teacher on their findings. B. Visit the school incinerator. C. Have a school custodian describe work and problems caused by litter. D. Have the city's director of Public Works give a talk on the problems caused by litter in the city. E. Also the teacher might have the school's principal stop in and give a quick "anti-litter" plug.
The students ze that by lit- adversely affects s his environment.		
pe Learned		
with fractions data		

Resource and Reference Materials	Continued and Additional Sugg
Publications: 100 MA Congressional Quarterly 1970 Man's Control of the Environment - to determine his survival so that he doesn't lay waste to his planet. Audio-Visual: film "Garbage" 1-C-E RMC 5263 "Biology: Population Ecology" (color) (EBF) 1963 6878 "Land Betrayed" (color) (10 min) BAVI Communtiy: Director of Public Works Department of Natural Resources	I. (Continued) C. 1. is this in 5 days? In 7 2. How many pounds of trash away a day? 3. Most Americans use about cans is this in 4 weeks? In 4. How many cans does a fam 5. Most Americans use about many bottles is this in 4 w 6. One 1965 car pollutes th 1970 cars. How many 1965 ca much as 45 1970 cars? 7. In 1970 a family of 6 pe 40 bottles and cans a week. Keep track of the number family throws away in one w

Materials	Continued and Additional Suggested Learning Experiences
arterly vironment val so that his -- bage" n 963 lor) -	I. (Continued) C. 1. is this in 5 days? In 7 days? 2. How many pounds of trash does a family of 6 throw away a day? 3. Most Americans use about 4 cans a week. How many cans is this in 4 weeks? In 8 weeks? 4. How many cans does a family of 6 use in a week? 5. Most Americans use about 3 bottles a week. How many bottles is this in 4 weeks? In 8 weeks? 6. One 1965 car pollutes the air as much as five 1970 cars. How many 1965 cars pollute the air as much as 45 1970 cars? 7. In 1970 a family of 6 persons threw away about 40 bottles and cans a week. Keep track of the number of bottles and cans your family throws away in one week.

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT

10. Short-term economic gains may produce long-term environmental losses.

Discipline Area

Subject

Problem Orienta

BEHAVIORAL OBJECTIVES	SUGGESTED L
Cognitive: The pupil will construct a graph on a flannelgraph showing the "villains" of water pollution. Affective: The pupil will suggest to his parents some ways of preventing waste from entering the water streams. Skills to be Learned 1. Construction of flannelgraph. 2. Basic multiplication. 3. Grouping by fives.	I. Student-Centered in clas activity A. The Villains of Water Pollution 1. Use flannelgraph to he students to visualize fol lowing numbers. Use squar or rectangles of the same size. a. Industry - 65% b. Municipal - 20% c. Agriculture - 15% Note: Instead of percen symbols use one hundred a being the whole and one square or rectangle to re present five parts of the whole. B. Have students work the following problems culmina ting with students placing the correct number of squa or rectangles on the flanne graph. 1. How many squares will needed to represent indus try's part in water pol- lution. (continued on reverse side

Short-term economic gains may
uce long-term environmental
es.

Discipline Area Mathematics

Subject Addition and/or Multiplication and/or grouping.

Problem Orientation Waste and water control Grade 3

HAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
ve: The pupil nstruct a graph on elgraph showing llains" of water on.	I. Student-Centered in class activity A. The Villains of Water Pollution 1. Use flannelgraph to help students to visualize following numbers. Use squares or rectangles of the same size. a. Industry - 65% b. Municipal - 20% c. Agriculture - 15% Note: Instead of percent symbols use one hundred as being the whole and one square or rectangle to represent five parts of the whole. B. Have students work the following problems culminating with students placing the correct number of squares or rectangles on the flannelgraph. 1. How many squares will be needed to represent industry's part in water pollution. (continued on reverse side)	II. Outside Resource and Community Activities A. Visit a nearby stream and search for signs of water pollution. B. Invite city health inspector to speak to the class about local water pollution.
ve: The pupil ggest to his some ways of ing waste from g the water .		
o be Learned truction of graph. multiplication. ping by fives.		

Resource and Reference Materials	Continued and Additional Suggested
Publications: Running Water I-C-E 120 MA 5 RMC The Fresh Water I-C-E RMC 130 MC 6 Pollution: A Handbook for Teachers inexpensive paperback from Scholastic Book Services Air and Water Pollution, Gerald Leinwald, Washington Square Press, 1969 Death of Sweet Water, Don Carr, Norton, 1966 The Water Lords, Ralph Nader's Study Group, Grossman Publish, 1971 Audio-Visual: 2903 Water Around Us (22 min) Movielot 1952 Water Famine 54 min. Association Films, 600 Grand Avenue., Ridgefield, New Jersey 07657 Problem with Water is People (30 min) McGraw Hill Contemporary films, 330 West 42nd Street, New York, New York 10018 Community: DNR official Water Disposal plant official Paper Mill official (Pollution expert) Factory Pollution expert County Ag. Extension agent	I. continued 2. How many squares represent Mu term to students) part in water 3. How many squares will be neec culture's part in water pollutic 4. What is the total number of C. Teacher note - make certain tha made to appear as the "bad buy". what we want and will buy. Some de used for washing add pollutants to fertilizers that farmers use drai and add wastes to water. These fi those wastes that take oxygen out D. Teacher should mention some of people are trying to eliminate wa not leave the children with a comp E. Discuss effects of farming on to point out that cattle pollute control over both the cattle and

ference Materials	Continued and Additional Suggested Learning Experiences
I-C-E 120 MA 5 I-C-E RMC ndbook for Teach- e paperback from Services ollution, Gerald ngton Square Press, Water, Don Carr, , Ralph Nader's ossman Publish, nd Us (22 min) min. Association d Avenue., Jersey 07657 ter is People Hill Contempor- West 42nd Street, ork 10018 plant official cial (Pollution on expert nsion agent	I. continued 2. How many squares represent Municipal's (explain term to students) part in water pollution? 3. How many squares will be needed to represent agriculture's part in water pollution? 4. What is the total number of parts? C. Teacher note - make certain that industry is not made to appear as the "bad buy". Industry only makes what we want and will buy. Some detergents, that are used for washing add pollutants to water. Also certain fertilizers that farmers use drain off the fields and add wastes to water. These figures represent only those wastes that take oxygen out of the water. D. Teacher should mention some of the ways in which people are trying to eliminate water pollution. (Do not leave the children with a complete negative attitude. E. Discuss effects of farming on pollution. Be sure to point out that cattle pollute less than man. Man has control over both the cattle and himself.

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT

11. Individual acts, duplicated or compounded, produce significant environmental alterations over time.

Discipline Area: Mathe

Subject: Orde

Problem Orientation: Q

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING E	
Cognitive: The learner will graph the increased land use caused by duplication of individual actions. Affective: The learner will propose ways of decreasing land use. Skills to be Learned 1. Coordinate points 2. Graphing 3. Subtraction 4. Interpretation	I. Student-Centered in class activity A. You will work on the land used when a home is built. 1. The homes in a wooded area are sold in lots of 2 acres each. 2. Set up a table. 3. Introduce a graph and co-ordinate points 4. Graph the increase on the co-ordinate graph 5. Discuss what happens to the forest as the land is gradually used up. B. Simulating an environmental change. 1. Give each student a shoe box or similar box - stand up triangles from a rig-a-jig to act as trees 2. Put a block into the box. This is a building. How many trees go? 3. Now introduce 3 or 4 blocks, How many trees go? C. Car Census 1. Count the cars that pass (continued on reverse side)	II. A. de ar B. on

cts, duplicated

roduce significant

terations over

Discipline Area Mathematics

Subject Ordered Pairs

Problem Orientation Quality of Life Grade 3

CTIVES	SUGGESTED LEARNING EXPERIENCES	
her ased plica- ctions. her de-	I. Student-Centered in class activity A. You will work on the land used when a home is built. 1. The homes in a wooded area are sold in lots of 2 acres each. 2. Set up a table. 3. Introduce a graph and co-ordinate points 4. Graph the increase on the co-ordinate graph 5. Discuss what happens to the forest as the land is gradually used up. B. Simulating an environmental change. 1. Give each student a shoe box or similar box - stand up triangles from a rig-a-jig to act as trees 2. Put a block into the box. This is a building. How many trees go? 3. Now introduce 3 or 4 blocks, How many trees go? C. Car Census 1. Count the cars that pass (continued on reverse side)	II. Outside Resource and Community Activities A. Visit the site of a housing development to see how forests are being eaten up. B. Real Estate Person to speak on land development.

Resource and Reference Materials	Continued and Add
Publications: Ecology the City Project I-C-E RMC 130 Mc Communtiy Planning Project I-C-E RMC 110GI Audio-Visual: FS St e Urban Ecology - Six Micro-organisms "A Construction Site" Kt 4 Man in His Environment-ICE-RMC "Cities are Different and Alike" BAVI Planning our Cities filmstrip rent from: Current Affairs Films Division of Key Productions 527 Madison Avenue New York, New York 10022 Community: Real Estate man City Planner	I. (continued) C. 1. by the buil what would hap 2. Graph resul 3. Discuss wha there a way th natural areas D. Use "Man in

s	Continued and Additional Suggested Learning Experiences
	I. (continued) C. 1. by the building in 10 minutes. If the number doubled what would happen? If it tripled. 2. Graph results. 3. Discuss what happens when an act is duplicated. Is there a way this could be stopped or changed so that natural areas could be preserved. D. Use "Man in His Environment" Game
on	
-RMC "	
ent	

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 12. Private ownership must be regarded as a stewardship and should not encroach upon or violate the individual right of others.

Discipline Area Mathe

Subject Volum

Problem Orientation Qual

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EX	II.
Cognitive: The learner will measure and record the volume of various areas. Affective: The learner will recommend better use of different spaces. Skills to be Learned 1. Volume 2. Measuring 3. Interpretation 4. Generalization	I. Student-Centered in class activity A. You will be working with volume and space 1. Use blocks and count blocks and volume needed. 2. Discuss the idea of space and using space. 3. Try to find out the space each person has at home. Discuss the needs that others have for space. Discuss rules to allow for personnel space. B. Use "Rescue in Space" Simulation Game Kt 4. 1. Use only the section on Space. Manual is very clear. 2. You may try measurement if possible . C. Use of space 1. Measure off an area in the room and have a student attempt to exercise in it. 2. Introduce more persons into the area or introduce objects into the area. Discuss what happens. 3. Discuss how putting things into an area or on your prop- (continued on reverse side)	A. in me B. re C. th

ownership must be re=
stewardship and should
upon or violate the
ight of others.

Discipline Area Mathematics

Subject Volume

Problem Orientation Quality of Life Grade 3

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
learner will ord the us areas. learner better t spaces. arned on on	I. Student-Centered in class activity A. You will be working with volume and space 1. Use blocks and count blocks and volume needed. 2. Discuss the idea of space and using space. 3. Try to find out the space each person has at home. Discuss the needs that others have for space. Discuss rules to allow for personnel space. B. Use "Rescue in Space" Simulation Game Kt 4. 1. Use only the section on Space. Manual is very clear. 2. You may try measurement if possible . C. Use of space 1. Measure off an area in the room and have a student attempt to exercise in it. 2. Introduce more persons into the area or introduce objects into the area. Discuss what happens. 3. Discuss how putting things into an area or on your prop- (continued on reverse side)	II. Outside Resource and Community Activities A. Have a person who has lived in both city and rural environments discuss the space used. B. FHA person speak on housing requirements. C. Go to a city street and see the space allowed each person.

Resource and Reference Materials	Continued and Additional Suggested Learn
Publications: Dr. Wang, Man and His Environment 160 Wa Proceedings of conference 1 I-C-E RMC Our Man Made Environment Book 7 I-C-E RMC 120 0 Kimball, Richard; Too Many People I-C-L RMC 190 Ki Audio-Visual: Communtiy: FHA Administrator City planner	I. (continued) C. 3. erty changes the way you can use things others can do on it. 4. Where have you seen your rights by another's use of space?

rence Materials	Continued and Additional Suggested Learning Experiences
His Environment s of conference conment Book 7 Too Many 190 Ki	I. (continued) C. 3. erty changes the way you can use it or changes the things others can do on it. 4. Where have you seen your rights encroached upon by another's use of space?

PROJECT I-C-E Episode Evaluation Form (Reproduce or du

Please fill in:
Subject: _____

Grade: _____

Concept No. Used: _____

In commenting on each episode used i
form. Feel free to adapt it and add m
your critiques and comments - negative
hand column, please rate (poor, good,
make specific comments or suggestions
vided to help us make this a more usab

Poor	Good	Exc.	
			I. Behavioral Objectives A. Cognitive:
			B. Affective:
			II. Skills Developed
			III. Suggested Learning Experiences A. In Class:
			B. Outside & Community Activities:
			IV. Suggested Resource & Reference Materials (specific suggestions & comments)

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In commenting on each episode used in your class, please use this form. Feel free to adapt it and add more pages. Let us know all your critiques and comments - negative and positive. In the left-hand column, please rate (poor, good, excellent) each item. Also, make specific comments or suggestions if possible in the space provided to help us make this a more usable guide. Thank you.

I. Behavioral Objectives
A. Cognitive:

B. Affective:

I. Skills Developed

I. Suggested Learning Experiences
A. In Class:

B. Outside & Community Activities:

V. Suggested Resource & Reference Materials
(specific suggestions & comments)

Project I-C-E
Serving Schools in CESA 3-8-9
1927 Main Street
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Project I - C - E INSTRUCTION - CURRICULUM - ENVI

A SUPPLEMENTARY PROGRAM FOR ENVIRONMENTAL EDUCATION

DISCIPLINE AREA Mathematics GRADE 4

Produced under Title III E.S.E.A.
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Robert
Robert
George

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ROGRAM FOR ENVIRONMENTAL EDUCATION

Mathematics GRADE 4

tle III E.S.E.A.
n CESA's 3-8-9
sin 54301
72 - 468-7464)

Robert Warpinski, Director
Robert Kellner, Asst. Director
George Howlett, EE Specialist

PREFACE

"Oikus" for house is the Greek origin of the term "ecology" studies our house--whatever or wherever it may be. Like an u expand or contract to fit many ranges--natural and man-made. environments, our many "houses" if we omit rancor and cite lo complexities. Our "oikus" uses the insights of all subjects. multidisciplinary program like ours necessarily results. Als a long time, our program ranges K thru 12. The environment m values. These values have their origin in the "oikus" of our minds. Let us become masters of our house by replacing the G with "Know thyself and thine house."

1. Written and designed by your fellow teachers, this guide i to fit appropriately into existing, logical course content
2. Each page or episode offers suggestions. Knowing your stu to adapt or adopt. Limitless chances are here for your ex Many episodes are self contained, some open-minded, still developed over a few days.
3. Try these episodes, but please pre-plan. Why? Simply, no and no curriculum will work unless viewed in the context o
4. React to this guide with scratch ideas and notes on the ep
5. After using an episode, fill out the attached evaluation f duplicate, or request more of these forms. Send them sing We sincerely want your reactions or suggestions--negative evaluations are the key in telling us "what works" and in the guides.

TERMS AND ABBREVIATIONS

ICE RMC is Project ICE Resource Materials Center serving al school districts in CESA 3, 8, and 9. Check the Project ICE resources. Our address and phone number is on thi guide's c or call us for any materials or help.

BAVI is Bureau of Audio Visual Instruction, 1327 University Madison, Wisconsin 53701 (Phone: 608-262-1644).

Cognitive means a measurable mental skill, ability, or proc

Affective refers to student attitudes, values, and feelings

PREFACE

is the Greek origin of the term "ecology". Environmental education whatever or wherever it may be. Like an umbrella, our house can to fit many ranges--natural and man-made. We can add quality to our any "houses" if we omit rancor and cite long range gains, costs, and "oikus" uses the insights of all subjects. Thus, a rational, positive, rogram like ours necessarily results. Also, since attitudes grow over ogram ranges K thru 12. The environment mirrors our attitudes or es have their origin in the "oikus" of our collective and individual me masters of our house by replacing the Greek adage of "Know thyself" and thine house."

igned by your fellow teachers, this guide is supplementary in nature-- tely into existing, logical course content.
isode offers suggestions. Knowing your students best, you decide what ot. Limitless chances are here for your experimentation and usage.
re self contained, some open-minded, still others can be changed or a few days.
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uide with scratch ideas and notes on the episode pages.
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nt your reactions or suggestions--negative and positive. Your the key in telling us "what works" and in aiding our revisions of

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ct ICE Resource Materials Center serving all public and non-public n CESA 3, 8, and 9. Check the Project ICE Bibliography of available idress and phone number is on this guide's cover. Feel free to write y materials or help.
f Audio Visual Instruction, 1327 University Avenue, P. O. Box 2093, n 53701 (Phone: 608-262-1644).
a measurable mental skill, ability, or process based on factual data.
s to student attitudes, values, and feelings.

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Kenneth Keliher, Appleton
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Robert Lee, Neenah
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tary Environmental Education Guides:

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Chriss, Hortonville
f Christensen, Winneconne
eth Couillard, Hortonville
ond Emerich, Hortonville
Ercegovac, Winneconne
Geeding, Menasha
ld Hale, Winneconne
s Huss, Freedom
er Lois Jonet, Holy Angels
eth Kappell, St. Aloysius
eth Keliher, Appleton
ett Klinzing, New London
Krueger, Oshkosh
Krueger, Winneconne
Rose LaPointe, St. John High
marie Lauer, Hortonville
rt Lee, Neenah
ld Lindhorst, St. Martin (L)
is Lord, Little Wolf
rt Meyer, Neenah
ld Neuzil, Shiocton
s Nuthals, Lourdes
ie Peterson, St. Martin (L)
mary Rafath, Clintonville
Reddel, St. Martin (L)
ys Roland, Little Wolf
ryn Rowe, Appleton
Margaret Sauer, Menasha
n Schaefer, Kaukauna
Smoll, Little Chute
s Stehr, Mt. Calvary (L)
er Stuvetraa, Cshkosh
ard Switzer, Little Chute
Van Susteren, Holy Name
Wertsch, St. Margaret Mary
en Wolf, Kimberly
Farrell, Menasha

CESA #9

Peter Biolo, West DePere
Lee Clasen, Lux.-Casco
Kathryn Colburn, Algoma
Merle Colburn, Algoma
Sara Curtis, Green Bay
Duane DeLorme, Green Bay
Roberta Dix, St. Joseph Acad.
Janet Elinger, Ashwaubenon
Phyllis Ellefson, Wash. Isle.
Keith Fawcett, West DePere
Jack Giachino, Seymour
Mike Gleffe, St. Matthews
Herbert Hardt, Gibraltar
Gary Heil, Denmark
Nannette Hoppe, How.-Suam.
Joseph Hucek, Pulaski
Catherine Huppert, DePere
DeAnna Johnson, Denmark
Kris Karpinen, West DePere
Mel Kasen, Gibraltar
Jack Koivisto, Green Bay
Sister Mary Alyce, Cathedral
Ellen Lotz, West DePere
Judilyn McGowan, Green Bay
Priscilla Mereness, Wrightstown
C. L. Paquet, Denmark
William Roberts, Sturgeon Bay
Roger Roznowski, Southern Door
Jan Serrahn, Sevastopol
Calvin Siegrist, How.-Suam.
Mary Smith, Green Bay
Carol Trimberger, Kewaunee
Mary Wadzinski, How.-Suam.

ESEA Title III - 59-70-0135-2 Projece I-C-E

CONCEPT 1. Energy from the sun, the basic source of all energy, is converted through plant photosynthesis into a form all living things can use for life processes

Discipline Area M

Subject Cha

Problem Orientatio

BEHAVIORAL OBJECTIVES	SUGGESTED LEARN
Cognitive: After collecting data on the highest daytime temperatures for given days from December through May and observing leaf growth of a tree, the student will write a paragraph explaining the sun's energy on plant growth. Affective: The student will orally defend the planting season of the area. Skills to be Learned 1. Thermometer reading 2. Observation and recording	I. Student-Centered in class activity A. The class will record temperatures at regular intervals to observe their effect on leaf growth of broadleaf tree. 1. Measure outside temperature and record daily on a chart from December to May. 2. Another team will write a monthly observation of the leaf growth of a broadleaf tree. 3. In May record the highest temperature for each month onto a chart. Compare this chart with the observation of leaf growth. 4. With group discussion make generalizations on the relationship between temperature and leaf growth. B. Extend the graph interpretations to cover the summer months. What does this indicate about the sun's energy on plant growth.

sun, the basic

gy, is converted

osynthesis into a

ings can use for life processes

Discipline Area Mathematics

Subject Charts and Reading Charts

Problem Orientation Sun's Energy Grade 4

TIVES	SUGGESTED LEARNING EXPERIENCES	
ecting aytime n rough f para- sun's n. nt e e g cording	I. Student-Centered in class activity A. The class will record temperatures at regular intervals to observe their effect on leaf growth of broadleaf tree. 1. Measure outside temperature and record daily on a chart from December to May. 2. Another team will write a monthly observation of the leaf growth of a broadleaf tree. 3. In May record the highest temperature for each month onto a chart. Compare this chart with the observation of leaf growth. 4. With group discussion make generalizations on the relationship between temperature and leaf growth. B. Extend the graph interpretations to cover the summer months. What does this indicate about the sun's energy on plant growth.	II. Outside Resource and Community Activities A. Record the atmospheric temperature for a week in early May. Go into a wooded area and record the temperature during the same week. At the end of May repeat the process. Is there a significant difference? What would this mean for the under growth in a forest?

Resource and Reference Materials	Continued and Additional Suggested
Publications: Conditions Affecting Life Minnemast Unit 23 I-C-E RMC Mini-Climates Holt, Rinehart, Winston I-C-E RMC 120 Ma Ecology American Book Co. 300 Pike Street Cincinnati, Ohio **Audio-Visual:** Ecology and Man Series No. 1 McGraw Hill Energy Relationships St9 Set 1 I-C-2 RMC **Community:** Astronomer or Planetarium guide to talk on the sun.	

e Materials	Continued and Additional Suggested Learning Experiences
Life -E RMC Rinehart, Ma Co.	
s rgy l	

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 2. All living organisms interact among themselves and their environment, forming an intricate unit called an ecosystem.

Discipline Area

Subject

Problem Orientatic

BEHAVIORAL OBJECTIVES	SUGGESTED LEAR
Cognitive: The student will record the interaction of factors necessary to support the life of two animals Affective: The student will recognize that all living organisms are interrelated to each other. Skills to be Learned 1. Listing of Members of a set 2. Construction of Venn Diagrams to find intersection 3. Discerning an intersection of a set 4. Listing an intersection	I. Student-Centered in class activity A. Have either actual animals or A.V. materials presenting animal habitats available. Students are to take two animals and list the factors necessary for the life of each. 1. Construct Venn Diagrams and place the information for each animal into the circles 2. List a. Union of the sets b. Intersection of the sets c. Subsets B. The students may repeat the process using different animals. C. Compare the intersections and find how animals relate and how the interrelation forms ecosystems.

nisms interact

nd their environ-

ntricate unit

m.

Discipline Area Mathematics

Subject Sets

Problem Orientation Ecosystem Grade 4

CTIVES	SUGGESTED LEARNING EXPERIENCES	
t c- ces- life of nt s of er-	I. Student-Centered in class activity A. Have either actual animals or A.V. materials presenting animal habitats available. Students are to take two animals and list the factors necessary for the life of each. 1. Construct Venn Diagrams and place the information for each animal into the circles 2. List a. Union of the sets b. Intersection of the sets c. Subsets B. The students may repeat the process using different animals. C. Compare the intersections and find how animals relate and how the interrelation forms ecosystems.	II. Outside Resource and Community Activities A. Take a field trip and construct Venn Diagrams to illustrate actual ecosystem interrelations B. Catch an actual insect or small animal and create an ecosystem that will support him. C. Invite a park or recreational facility planner who can share with the students ideas and factors which go into the planning of a park or recreational area. D. Simulate the planning of a zoo facility.

Resource and Reference Materials	Continued and Additional Suggested
Publications: Ecology: Web of Life Series: Benziger, 866 Third Avenue New York, New York, I-C-E RMC 130 Mc10 Ecology American Book at I-C-E Subarsky, Zachariah Living Things in Field and Classroom, Minnesota Mathematics and Science Teaching Project Ecolab Johnson and Mann Benefic Press Available at I-C-E K: 21 RMC Audio-Visual: Ecological Systems : Imperial Film Co. 4 filmstrips World of Animals available at I-C-E RMC Interrelationships of Plants and Animals SVE ROA Films, Milwaukee Urban Ecology: Six Microsystems (Filmstrip) I-C-E RMC Ecology and Man Series No. 2 McGraw Hill available at I-C-E RMC Nature's Half Acre Film N-210 I-C-E RMC Pond Life BAVI $2.25 Communities	

rials	Continued and Additional Suggested Learning Experiences
:	
ems	
2 C-E	
10	

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT 3. Environmental factors are limiting on the numbers of organisms living within their influence, thus, each environment has a carrying capacity.

Discipline Area Mathematics

Subject 2,3,4 Digit Mul

Problem Orientation Limitation

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENC	
Cognitive: The students will be able to calculate by multiplication the number of organisms destroyed by the construction of housing or industrial projects. Affective: The student will contribute to sustaining the life of a living organism. Skills to be Learned 1. Measuring off square yards 2. Plant Identification 3. Multiplication of 2,3,4 digit numbrals 4. Recording Data	I. Student-Centered in class activity A. You will count organisms in an open field. 1. Measure off a square foot in an open field. Count the number of each kind of organism within the square yard. 2. Record on a chart. B. Consult an industrial planner or construction worker to find the size of a given housing project industrial plant. 1. Then multiply the size by the number of organisms per square foot. 2. Record these results on the chart. C. Discuss the effects of the plant and animal loss on the total environment. D. Propose a plan to replace the lost plants and animals.	II. Outside Commun A. Compar of organi field and industria factors. B. If the project i to illust

ors are limiting
anisms living
e, thus, each
rying capacity.

Discipline Area Mathematics

Subject 2,3,4 Digit Multiplication

Problem Orientation Limitation of organisms Grade 4

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ts.

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. You will count organisms in an open field.
1. Measure off a square foot in an open field. Count the number of each kind of organism within the square yard.
2. Record on a chart.

B. Consult an industrial planner or construction worker to find the size of a given housing project industrial plant.
1. Then multiply the size by the number of organisms per square foot.
2. Record these results on the chart.

C. Discuss the effects of the plant and animal loss on the total environment.

D. Propose a plan to replace the lost plants and animals.

II. Outside Resource and Community Activities

A. Compare and classify the kinds of organisms found within an open field and in a residential and/or industrial area. List limiting factors.

B. If there is a development project in the area - take pictures to illustrate before and after.

Resource and Reference Materials	Continued and Additional Suggested Lea
Publications: Community Planning Handbook 100 Gi at I-C-E RMC Living Things in Field and Classroom 110 Subarsky at I-C-E RMC Mini-climates Holt,Rinehart and Winston 120 Ma at I-C-E RMC Audio-Visual: Ecology and Man Series No. 3 McGraw Hill at I-C-E RMC St 9 No Room for Wilderness BAVI $11.00 Man Uses and Changes the Land BAVI $4.00 The Ecological Crisis Evolution and Extinction K 14 I-C-E RMC Community: Agricultural or County Agent.	

erials	Continued and Additional Suggested Learning Experiences
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ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT: 4. An adequate supply of pure water is essential for life.

Discipline Area: Mathematics

Subject: Measurement a

Problem Orientation: Pure Water

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIEN	
Cognitive: The student will identify the relationship between the diameter of a hose and the quantity of water that can pass through it. Affective: The student is conscious of the limited water supply and selects a hose in accordance with the quantity needed. Skills to be Learned 1. Linear Measurement 2. Liquid Measurement 3. Collecting data and making a chart 4. Graphing data	I. Student-Centered in class activity A. You will work with various hose sizes. 1. Measure the diameter of the hoses and label. 2. Attach the hose to a tap and allow water to flow (turned on full) for 10 seconds into a pail. Use a stop watch or second hand to assure exact timing. 3. Measure the amount of water collected and record. 4. Repeat the process for each hose size. 5. Chart your information. 6. Graph the information. B. If you collect water for 20 seconds from each does the amount double? Test your answer by measurement.	II. Outsid Commun A. Examin pipes as giving th thickness purpose f Discuss p ber. B. Figure usage for using the Or use th cipality 1st 500 cu next 9,500 over 10,00 Service Ch Minimum M

y of pure

or life.

Discipline Area Mathematics

Subject Measurement and timing

Problem Orientation Pure Water Supply Grade 4

IVES	SUGGESTED LEARNING EXPERIENCES	
a-	I. Student-Centered in class activity A. You will work with various hose sizes. 1. Measure the diameter of the hoses and label. 2. Attach the hose to a tap and allow water to flow (turned on full) for 10 seconds into a pail. Use a stop watch or second hand to assure exact timing. 3. Measure the amount of water collected and record. 4. Repeat the process for each hose size. 5. Chart your information. 6. Graph the information. B. If you collect water for 20 seconds from each does the amount double? Test your answer by measurement.	II. Outside Resource and Community Activities A. Examine and measure as many pipes as possible. Make a chart giving the inside diameter, thickness of wall, material, and purpose for each pipe. Discuss pipe sizes with a plumber. B. Figure the cost of water usage for the school or a home using the rates from the area. Or use the scale from a municipality given here: Cost per 100 cu. ft. 1st 500 cu. ft. 36¢ next 9,500 18¢ over 10,000 12¢ Service Charge 60¢ Minimum Monthly charge $1.10

Resource and Reference Materials	Continued and Additional Suggested Learning E
Publications: Ecolab - Johnson and Mann Benefic Press I-C-E IMC Kit 21 Running Water Stecher, Wentworth Holt, Rinehart and Winston I-C-E RMC120 Na 5 Water Life Science Library Leopold and Davis New York Time Inc. Audio-Visual: Water for Tomorrow KDI Instructional Systems 1870 MacKenzie Drive Columbus, Ohio $29.00 K 5 Aggradation and Degradation Merrimac River I-C-E RMC City Water Supply BAVI $2.00 Water BAVI $2.00 Water Pollution BAVI FS St f Woods Educational Filmstrips (Marine Pollution Freshwater Pollution) Community: Plumber Health Inspector to speak on water quality	

Materials	Continued and Additional Suggested Learning Experiences
nn Benefic Wentworth ton ary 870 ra- al ution ak	

ESEA Title III- 59-70-0135-2 Project I-C-E

CONCEPT 5. An adequate supply of clean air is essential because most organisms depend on oxygen, through respiration, to release the energy in their food.

Discipline Area Mathematics

Subject Computation of money

Problem Orientation Air can pollute

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENC	
Cognitive: The student will compute and compare cost of air pollution for a given person in the U.S. Affective: The student will develop a consciousness of the cost of air pollution and write a letter of concern to a local polluter. skills to be Learned 1. Idea of estimation 2. Addition and subtraction of Money 3. Problem solving 4. graphs	I. Student-Centered in class activity A. Give the students the fact sheet of costs per person for air pollution. 1. Build an investigation sheet using the statistics. B. Discuss factors that might introduce variations to the cost per person.	II. Outside Communi A. Using f from an ex Then try t residue is B. Examine a furnace. filter in Make gener dust in th filters.

te supply of clean air is
cause most organisms
ygen, through respira-
ease the energy in their food.

Discipline Area Mathematics

Subject Computation of money and graphing of money

Problem Orientation Air can be polluted Grade 4

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
student d compare ution for n the U.S. student onscious- of air ite a n to a rned ation subtrac- ng	I. Student-Centered in class activity A. Give the students the fact sheet of costs per person for air pollution. 1. Build an investigation sheet using the statistics. B. Discuss factors that might introduce variations to the cost per person.	II. Outside Resource and Community Activities A. Using filter paper, trap air from an exhaust pipe of a car. Then try to find out what the residue is made of. B. Examine the air filter from a furnace. If possible check the filter in a week and a month. Make generalizations on the dust in the air and the need for filters.

Resource and Reference Materials

Publications:

Man's Control of the Environment
100 Ma I-C-E RMC
Needed Clear Air pamphlet from
EPA 1 North Wacker Drive
Chicago, Illinois, 60606
Smog Simulation Game at I-C-E
RMC sgl
Air Pollution
National Air Pollution Control
5600 Fishers Lane
Rockville, Maryland 20852

Audio-Visual:

Ecology and Man Series no. 3
McGraw Hill at I-C-E RMC
America's Urban Crisis
(Air Pollution Menace)
K-13 at I-C-E RMC
FS St I Ward's Educational
Filmstrips (Atmospheric Con-
trol)
Air and Water Pollution
Scott Educational Division
Transparency Set 45¢
Box 391
Holyoke, Mass. 01040

Community:

Statistics from a factory
in the area on the cost
of air pollution.

Continued and Additional Suggested Learn

Statistics to include on estimated cost per person:

Farming Loss	$2.50
Human Health	2.00
Cleaning	2.00
Clothing Replacement	2.50
Soiling and Deterioration	3.00
Corrosion	2.50
Maintenance	2.00
Property Devaluation	1.00

1. What is the total cost per person?
2. How much would air pollution cost if
for 6 years and had to keep it looking
3. If you were a parent of 3 children,
your children lose on clothing in 1 year
4. A farmer loses how much on corrosion
used for 10 years.
5. Soil deterioration costs how much mor

Put this onto a simple bar graph to comp

cost	50¢	$1.00	$1.50	$2.00	$2.50
Farming					
Health					
Cleaning					

rials	Continued and Additional Suggested Learning Experiences
nment	Statistics to include on estimated cost of air pollution per person:
from	Farming Loss $2.50 Human Health 2.00 Cleaning 2.00 Clothing Replacement 2.50 Soiling and Deterioration 3.00 Corrosion 2.50 Maintenance 2.00 Property Devaluation 1.00
-E	
rol	
3	1. What is the total cost per person? 2. How much would air pollution cost if you owned a house for 6 years and had to keep it looking good? 3. If you were a parent of 3 children, how much would your children lose on clothing in 1 year. 4. A farmer loses how much on corrosion of a plow if it is used for 10 years. 5. Soil deterioration costs how much more than health?
-	Put this onto a simple bar graph to compare the cost
	cost 50¢ $1.00 $1.50 $2.00 $2.50 $3.00 Farming Health Cleaning

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT

6. Natural resources are not equally distributed over the earth or over time and greatly affect the geographic conditions and quality of life.

Discipline Area Mathematics

Subject Sets - Unio

Problem Orientation Mineral

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIEN	
Cognitive: Given a set of valuable mineral resources for two states, the students will list the union and intersection. Affective: The student will develop a consciousness of the distribution of mineral resources. Skills to be Learned Tabulation of union of sets Tabulation of Intersection of sets Empty sets Subsets Use of Venn Diagrams	I. Student-Centered in class activity A. Give the students the list of mineral resources on reverse side. B. After the worksheet is finished discuss the need for cooperation. C. Find the intersection and compare the area characteristics. D. You can do a similar process using rainfall statistics.	II. Outsi Commu A. Go to tural re area. 1. Find amount. 2. Comp state p

esources are not equally

cver the earth or over

etly affect the geographic

rd quality of life.

Discipline Area Mathematics

Subject Sets - Union - Intersection

Problem Orientation Mineral Resources Grade 4

AL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
a set ral c states, l list the ection. student onscious- ribution of s. rned ion of tersection grams	I. Student-Centered in class activity A. Give the students the list of mineral resources on reverse side. B. After the worksheet is finished discuss the need for cooperation. C. Find the intersection and compare the area characteristics. D. You can do a similar process using rainfall statistics.	II. Outside Resource and Community Activities A. Go to the site of a natural resource processing a area. 1. Find out the production amount. 2. Compare this to other state production amounts.

Resource and Reference Materials	Continued and Additional Suggested Learn
Publications: Investigating Man's World Regional Studies Scott Foresman I-C-E RMC World Resources Ginn and Co. 940 Sa at I-C-E RMC From Sea to Shining Sea Report on the American Environment Washington D.C. at I-C-E RMC Audio-Visual: "Our Natural Resources" color 11 min. BAVI "Man Uses and Changes the Land" BAVI K 28"Saving What's Left" (Utilizing our Resources Adding to our Resources) I-C-E RMC Community: The owner of a gravel pit or sand pit DNR representative	List of Mineral Resources Wisconsin — Sand, gravel, stone, Illinois — Coal, Petroleum, ston Indiana — coal, cement, stone, Iowa — cement, stone, sand, Michigan — Iron ore, cement, cop Kansas — Petroleum, natural ga liquids, Ohio — coal, stone, lime, ce South Dakota — gold, sand, gravel, s Use Venn Diagrams Tabulate the intersection and union. 1. Wisconsin and Illinois 2. Wisconsin and Michigan 3. Kansas and South Dakota Tabulate intersection and union 1. Wisconsin and South Dakota 2. Wisconsin and Ohio 3. Wisconsin and Iowa 4. Wisconsin and Indiana 5. Wisconsin and Kansas

Continued and Additional Suggested Learning Experiences

List of Mineral Resources

Wisconsin	Sand, gravel, stone, cement, zinc
Illinois	Coal, Petroleum, stone, sand gravel
Indiana	coal, cement, stone, petroleum
Iowa	cement, stone, sand, gravel, gypsum
Michigan	Iron ore, cement, copper, sand, gravel
Kansas	Petroleum, natural gas, helium, natural gas liquids,
Ohio	coal, stone, lime, cement
South Dakota	gold, sand, gravel, stone cement,

Use Venn Diagrams
Tabulate the intersection and union.

1. Wisconsin and Illinois
2. Wisconsin and Michigan
3. Kansas and South Dakota

Tabulate intersection and union

1. Wisconsin and South Dakota
2. Wisconsin and Ohio
3. Wisconsin and Iowa
4. Wisconsin and Indiana
5. Wisconsin and Kansas

CONCEPT 7. Factors such as facilatating transportation, economic conditions, population growth, and increased leisure time have a great influence on changes in land use and centers of population density.

Discipline Area Mathemati

Subject Computati

Problem Orientation Populat

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCE	II. Ou Co
Cognitive: The student will construct and compare population tables showing U.S. city and rural population in census years since 1900. Affective: The student will develop and defend his position on the dangerous effects of increasing population on land use and population density. Skills to be Learned Collecting Data Organizing Construcing Tables Subtraction Graphing Making Judgements	I. Student-Centered in class activity A. Collect data from the Almanac or encyclopedia on urban and rural populations since 1900 (Use the figures from each census. 1. Make tables of the facts. 2. Find the difference between rural and urban populations for each census. Then graph the difference. B. Discuss continuing increase of population on 1. Land use 2. City growth 3. Resource usage	A. In plann of re 10 ye B. Usi Graph parks C. Usi acrea Popula 1960 62 64 66 68 70 71 Cro 500,00 420,00 250,00 250,00 420,00 160,00

n as facilatating

, economic conditions,

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ave a great influence

land use and centers of population density.

Discipline Area Mathematics

Subject Computation and graphing

Problem Orientation Population shift Grade 4

TIVES	SUGGESTED LEARNING EXPERIENCES	
dent d com- ables and in e 1900. udent de- on ects ula- and y. ned s	I. Student-Centered in class activity A. Collect data from the Almanac or encyclopedia on urban and rural populations since 1900 (Use the figures from each census. 1. Make tables of the facts. 2. Find the difference between rural and urban populations for each census. Then graph the difference. B. Discuss continuing increase of population on 1. Land use 2. City growth 3. Resource usage	II. Outside Resource and Communtiy Activities A. Invite an assessor or City planner who can show the expansion of residential area over the past 10 years. Map out this change. B. Using data from EQ Index. Graph the pressures on national parks. C. Using the EQ Index graph the acreage of cropland that is lost. Population data 1960 to 1970 Millions of people 62 90 64 120 66 150 68 160 70 180 71 200 Cropland 500,000 acres More Parks 420,000 " Flood control 250,000 " Wildlife refuge 250,000 " Recreational area 420,000 " Urban development 160,000 " Airport & Highways

Resource and Reference Materials	Continued and Additional Suggested Learning Ex
Publications: Mini-Climates - at I-C-E 120 Ma 1971 EQ Index - National Wildlife Magazine I-C-E RMC V.F. Ecology the City Benziger I-C-E RMC 130 Ma 10 "Man's Control of the Environment" Congressional Quarterly I-C-E RMC 100 Ma Audio-Visual: The Ecological Crisis SVE K-13 at I-C-E RMC Population Explosion part 5 New York Times I-C-E RMC 3849 Expanding City 15 min. $2.00 BAVI Kit 13 America's Urban Crisis (The Housing crisis - The Transportation Crisis) Community: Local Realator Assessor Sanitary Department Official	

Continued and Additional Suggested Learning Experiences

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT

8. Cultural, economic, social, and political factors determine status of man's values and attitudes toward his environment.

Discipline Area: Mathema

Subject: Comparis

Problem Orientation: Atti
envi

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
Cognitive: Given a questionaire, the learner will collect and compare data on the use of environment for recreation. Affective: The student will support positive use of the environment for recreation. Skills to be Learned Recording data on a Comparison by subtraction Generalizing from data	I. Student-Centered in class activity A. You will survey use of recreational facilities 1. Prepare and distribute a questionaire on use of the environment for recreation. (sample on reverse side) 2. Put the data onto the table. 3. Find the difference between the positive and negative response for each age group. 4. Find the difference between age group responses to the questions. 5. Using the data and the figures from subtraction, write a summary statement on the change in attitude and use of environment for for recreational purposes.	II. O C A. P picni to a B. Ha and near C. Us cost famil D. Fi being your parks

conomic, social,	Discipline Area	Mathematics
actors determine	Subject	Comparison by Subtraction
values and attitudes	Problem Orientation	Attitude toward environment — Grade 4
ronment.		

IVES	SUGGESTED LEARNING EXPERIENCES	
a learner ompare envir- ion.	I. Student-Centered in class activity A. You will survey use of recreational facilities 1. Prepare and distribute a questionaire on use of the environment for recreation. (sample on reverse side) 2. Put the data onto the table. 3. Find the difference between the positive and negative response for each age group. 4. Find the difference between age group responses to the questions. 5. Using the data and the figures from subtraction, write a summary statement on the change in attitude and use of environment for for recreational purposes.	II. Outside Resource and Community Activities A. Plan the food needed for a picnic lunch for the class and go to a nearby wayside or park. B. Have a person from the Park and Recreation Commission of a nearby city speak to the class. C. Using a catalog calculate the cost of camping equipment for a family of 5. D. Find out the amount of money being spent on local parks in your area, state parks, national parks.
dent ive ment		
ed		

Resource and Reference Materials

Publications:

E Q IndeX from I-C-E RMC

V.F.

The Environmental School

120 Me from I-C-E RMC

Camp Recreation - Wausau

I-C-E RMC

The Best Nature Writing

of Joseph Wood Krutch

I-C-E RMC

Biennel Report of DNR

I-C-E RMC V.F.

Door County Natural Beauty

Summary Report I-C-E RMC

Audio-Visual:

K. No. 5 Aggradation Degradation I-C-E RMC

Nature is for People BAVI

National Parks BAVI

Adventuring in Conservation

BAVI

Camp Happiness BAVI

Community:

Park Director

DNR Person

Game Warden

Campsite Director

Continued and Additional Suggested Learning E

QUESTIONAIRE

(Age grouping - Circle one over 50, 49-16,

1. Does your family own a camper, tent, or co
2. Have you been to a state park? YES NO
3. Do you go to parks and waysides in your ar
4. Does your family go swimming or to the bea
5. Have you flown a kite? YES NO
6. Would you contribute $10.00 to the buildin YES NO
7. Do you go fishing or hunting? YES NO

DATA SHEET

AGE	Under 15		49-16		
Question	Number Yes	Number No	Number Yes	Number No	N
No. 1					
No. 2					
No. 3					
No. 4					
No. 5					
No. 6					
No. 7					

terials | Continued and Additional Suggested Learning Experiences

QUESTIONAIRE

(Age grouping - Circle one over 50, 49-16, under 15

1. Does your family own a camper, tent, or cottage? YES NO
2. Have you been to a state park? YES NO
3. Do you go to parks and waysides in your area? YES NO
4. Does your family go swimming or to the beach? YES NO
5. Have you flown a kite? YES NO
6. Would you contribute $10.00 to the building of a new park? YES NO
7. Do you go fishing or hunting? YES NO

DATA SHEET

AGE	Under 15		49-16		Over 50	
Question	Number Yes	Number No	Number Yes	Number No	Number Yes	Number No
No. 1						
No. 2						
No. 3						
No. 4						
No. 5						
No. 6						
No. 7						

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT: 9. Man has the ability to manage, manipulate, and change his environment.

Discipline Area: Ma

Subject: Me

Problem Orientation:

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNIN
Cognitive: The students will be able to measure cups, and centimeters and be able to read a meter stick. Affective: The students will realize that man has the ability to change a plant's ability to grow through the use of plant food and fertilizer. Skills to be Learned 1. Reading a meter stick 2. Measuring 3. Recording	I. Student-Centered in class Activity A. You will work with soils. 1. Fill three boxes with a low quality dirt containing gravel, clay, etc. 2. Germinate bean seeds and plant them in the boxes. 3. Obtain a quality water soluble fertilizer and plant food. Box # 1 mix half the recommended dosage in 1 cup of water, for Box # 2 mix the full recommended dosage in 1 cup of water for the plant. For Box # 3 water the plant with water only. 4. The students must carefully measure and record the water and plant for the boxes. 5. As the plants grow, have the students measure the plants progressive gain in height(every two days) in centimeters and record it. 6. Compare the gains in height in the boxes receiving plant food. Graph the results of each box so progress can be observed.

the ability to manage,

and change his environ-

Discipline Area Mathematics

Subject Measurement and Graphing

Problem Orientation Manipulation Grade 4

BJECTIVES	SUGGESTED LEARNING EXPERIENCES	
students o measure imeters read a meter e students hat man has change a to grow e of plant lizer. earned eter stick	I. Student-Centered in class Activity A. You will work with soils. 1. Fill three boxes with a low quality dirt containing gravel, clay, etc. 2. Germinate bean seeds and plant them in the boxes. 3. Obtain a quality water soluble fertilizer and plant food. Box # 1 mix half the recommended dosage in 1 cup of water, for Box # 2 mix the full recommended dosage in 1 cup of water for the plant. For Box # 3 water the plant with water only. 4. The students must carefully measure and record the water and plant for the boxes. 5. As the plants grow, have the students measure the plants progressive gain in height(every two days) in centimeters and record it. 6. Compare the gains in height in the boxes receiving plant food. Graph the results of each box so progress can be observed.	II. Outside Resource and Community Activities A. Invite a farmer to talk about the use of chemical fertilizer and insecticide. B. Agent can talk to the students and offer statistics and facts on the influence of fertilizer.

Resource and Reference Materials	Continued and Additional Suggested
Publications: Thomas William L. (ed) Man's Role in Changing the Face of the Earth Chicago Press 1956 Environmental Science Center Nov. 1970 "Ecology - A handbook for Environmental Action - What can I do?" Ecology: The Farm Benziger I-C-E RMC 130 Mc Audio-Visual: "Discovering Life Around Us: A Visit to the Farm" Encyclopedia Britannica Films Rental and Purchase Library 425 North Michigan Avenue Chicago, Illinois 60611 "Ecological Imbalances" FS St 2 at I-C-E RMC Community: Consult with a farmer on problems of his field areas and learn his recommendations. Visit a greenhouse. Get a gardeners views on soil requirements. (or successful gardeners in the area.	

Continued and Additional Suggested Learning Experiences

ESEA Title III - 59-70-0135 -2 Project I-C-E

CONCEPT: 10. Short-term economic gains may produce long-term environmental losses.

Discipline Area: Mathematics

Subject --- Problem Solving

Problem Orientation: Short and Long
tors

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
Cognitive: The student will be able to compare the supply and demand of timber consumption in the United States Yearly. Affective: The student will realize, that without proper planning and use of timber resources the supply will soon be depleted. Skills to be Learned 1. Problem Solving 2. Critical Analysis 3. Discussion Groups	I. Student-Centered in class activity A. President Nixon's policy on housing. Five year goal of 3 million new housing units annually requiring 60% more timber and 7 billion board feet more annually from national forest. *(Teacher Discussion Question) Can this be done and still maintain a policy of multiple use and sustained yield? Or will the urgent need for timber clash with other environmental values - wild life , recreation and watershed protection. Problems: 1. Need 18.8 billion cu.ft. growth 16.6 cu. ft. shortage How many billion cu. ft.? 2. The average person now uses 560 lbs. of paper a year. In 2000 A.D. each person will need 1000 lbs. of paper per year. What is the increase of each person's needs. (continued on reverse side)	II. Outside Re Community A. Invite a r local papermi class about t timber that i in making pap est from whic of trees are for paper pro B. Have a mem of Natural Re classroom. Di woodland asse states potent products outp

m economic gains may

-term environmental

Discipline Area Mathematics

Subject Problem Solving

Problem Orientation Short and Long term factors Grade 4

JECTIVES	SUGGESTED LEARNING EXPERIENCES	
tudent compare emand of on in the arly.	I. Student-Centered in class activity A. President Nixon's policy on housing. Five year goal of 3 million new housing units annually requiring 60% more timber and 7 billion board feet more annually from national forest. *(Teacher Discussion Question) Can this be done and still maintain a policy of multiple use and sustained yield? Or will the urgent need for timber clash with other environmental values - wild life , recreation and watershed protection. Problems: 1. Need 18.8 billion cu.ft. growth 16.6 cu. ft. shortage How many billion cu. ft.? 2. The average person now uses 560 lbs. of paper a year. In 2000 A.D. each person will need 1000 lbs. of paper per year. What is the increase of each person's needs. (continued on reverse side)	II. Outside Resource and Community Activities A. Invite a representative of a local papermill to talk to the class about how they select the timber that is cut for their use in making paper. Where is the forest from which they cut? What kind of trees are most commonly used for paper products? B. Have a member of the Department of Natural Resources visit your classroom. Discuss your areas woodland assests. Discuss the states potential and annual wood products output.
student at with- ing and sources oon be		
rned ng ysis oups		

Resource and Reference Materials	Continued and Additional Suggested Learnin
Publications: Poster: "If we don't preserve this Natural Beauty. Life will become a Dead Issue." Mem Co. , P.O. Box 273, New York 10046 $1.00 17" X 22" Color Poster Eagle over wooded mountain range. Audio-Visual: "Ecological Systems" Imperial Film Co., 321 S. Florida Ave. Lakeland, Florida 33803 $36.00 Forest Biome etc. 4 film strips 2 records "Fallin Northern Wisconsin"11 min. BAVI 1696 "Place to Live" $3.00 1941 BAVI 18 min. Fs St2 "Ecological Imbalance" I-C-E RMC Community: Housing Construction Projects Barn Construction in rural area School supply room. Office supply rooms local companies (to note paper needs)	I. continued *Discussion 3.2 million acres burn ev we prevent this waste? 3. It takes 12,000 board feet to build board feet will it take to build 3 mill

Materials	Continued and Additional Suggested Learning Experiences
reserve ife will , New Poster ıtain mperial da Ave. 3 $36.00 lm strips nsin"11 min. 3.00 alance" rojects ural area te paper	I. continued *Discussion 3.2 million acres burn every year. How can we prevent this waste? 3. It takes 12,000 board feet to build one house. How many board feet will it take to build 3 million houses?

ESEA Title III - 59-70-0135 -2 Project I-E-E

CONCEPT

11. Individual acts, duplicated or compounded, produce significant environmental alterations over time.

Discipline Area: Mathematics

Subject: Numeration (Additi

Problem Orientation: Waste Disposal

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
Cognitive: The child will compute by addition the weight of classroom paper owned by all students which, ultimately will be disposed of as waste. Affective: The student will criticize amount of paper consumed by himself and peers and respond to the value of economy in keeping waste down. Skills to be Learned Planning Observation Collecting Organizing Computation Criticizing	I. Student-Centered in class activity A. The class will weigh the amount of paper (notebooks/ looseleaf) they have in their desks. This amount will be added to the amount in other classes and a total weight in pounds determined for the entire school. 1. This can be done by rows, having each child add the weight of his paper to his neighbors. 2. The amount in total for each row can then be added to the sum of other rows. B. The class will endeavor to research the relationship between pounds of paper and amount of trees. C. Then calculate the actual wasting of paper per room. Work to find the number of trees destroyed by waste. D. After a week of concerted effort and participation again calcualte the waste. See in (continued on reverse side)	II. Outside Re Community A. Invite rep local paper c class as to t new paper in value of wast B. Invite rep waste disposa with class t up and dispos C. If recycli the area - su an hour on Sa ing in colle of newspaper

cated or

ficant

over

Discipline Area Mathematics

Subject Numeration (Addition)

Problem Orientation Waste Disposal Grade 4

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

A. The class will weigh the amount of paper (notebooks/ looseleaf) they have in their desks. This amount will be added to the amount in other classes and a total weight in pounds determined for the entire school.

1. This can be done by rows, having each child add the weight of his paper to his neighbor's.
2. The amount in total for each row can then be added to the sum of other rows.

B. The class will endeavor to research the relationship between pounds of paper and amount of trees.

C. Then calculate the actual wasting of paper per room. Work to find the number of trees destroyed by waste.

D. After a week of concerted effort and participation again calcualte the waste. See in

(continued on reverse side)

II. Outside Resource and Community Activities

A. Invite representative from local paper company to inform class as to the value per pound new paper in child's desk and value of waste paper.

B. Invite representative from waste disposal plant to discuss with class the cost of picking up and disposing of waste paper.

C. If recycling is going on in the area - support it by working an hour on Saturdays or by helping in collection and bailing of newspaper or other materials.

Resource and Reference Materials	Continued and Additional Suggeste
Publications: America's Natural Resources Callison, Charles H. 1967 Future Environments of North America Darling, F. & Milton, John P. Trees and Forests Jepson, Stanley H. Audio-Visual: "Conservation of Our Forests" (film strip) EYE Gate House, Inc. 432 Park Ave. New York Aggradation/Degradation Kt 5 "Ecological Imbalance" Fs St 2 at I-C-E RMC Community: Paper Mill Representative County Forester Waste Disposal Plant Representative	I. continued D. recycling if the number of t decreased. E. Try schemes in classroom to record of what it might amount

ce Materials	Continued and Additional Suggested Learning Experiences
sources . 1967 of North & Milton, pson, Stanley Forests" rk ion e" Fs ative Re-	I. continued D. recycling if the number of trees destroyed by waste has decreased. E. Try schemes in classroom to actually save paper - keep record of what it might amount to in a month's time.

ESEA Title III - 59-70-0135-2 Project I-C-E

CONCEPT

12. Private ownership must be regarded as a stewardship and should not encroach upon or violate the individual right of others.

Discipline Area Mathematics

Subject Money value

Problem Orientation Stewards

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERI	
Cognitive: Given a simulation game on recycling resources the student will act as an individual company and deal with the problems of production, consumption and pollution. Affective: The student will recognize the need for cooperative action in order to solve pollution and be willing to sacrifice some monetary gain for that goal. Skills to be Learned Decision Making Critical thinking Addition and subtraction of money	I. Student-Centered in class activity Use Recycling Resources A. Prepare the students by using Solid waste pollutants (Filmstrip from URBAN CRISIS K-13 at I-C-E B. Use the recycling resources Simulation Game (available from I-C-E RMC) C. 1. Discuss the results and the kinds of decisions that had to be made. 2. Discuss the results of one person's pollution and its effects on the entire group.	II. Outs Comm A. Visi or have speak t B. Try money b maintena vironme project Then co decreas creasin

rship must be re-

ardship and should

n or violate the

of others.

Discipline Area Mathematics

Subject Money value

Problem Orientation Stewardship Grade 4

VES	SUGGESTED LEARNING EXPERIENCES	
simu- cling nt will al com- the ion, lution. dent need ion in ution acri- gain d ction	I. Student-Centered in class activity Use Recycling Resources A. Prepare the students by using Solid waste pollutants (Filmstrip from URBAN CRISIS K-13 at I-C-E B. Use the recycling resources Simulation Game (available from I-C-E RMC) C. 1. Discuss the results and the kinds of decisions that had to be made. 2. Discuss the results of one person's pollution and its effects on the entire group.	II. Outside Resource and Community Activities A. Visit a waste treatment plant or have the director of a plant speak to the students. B. Try to compile the amount of money being put into creation and maintenance of recycling or environmental quality improvement projects within the local area. Then compare the increase or decrease to the need and the increasing awareness of decadence.

Resource and Reference Materials	Continued and Additional Suggested Learning
Publications: "Investigating Man's World" Metropolitan Studies Unit 4 Scott Foresman, Economics Unit 5 "The Social Sciences" Harcourt Stone, A New Ethic for a New Earth Friendship Press New York $1.95 Audio-Visual: "Recycling Resources" Continental Can Co. Simulation game available at I-C-E Sg 6 Set I "America's Urban Crisis" Group 1 SVE K-13 available at I-C-E RMC "Ecological Crisis" K-14 SVE I-C-E RMC Community: Manufacturing Areas observing industrial complexes and waste piles, Observe garbage dumps and effect on the environment. Observe barns and yards.	

terials	Continued and Additional Suggested Learning Experiences
d" 4 es" ss ving t.	

PROJECT I-C-E Episode Evaluation Form (Reproduce or duplicate as nee

Please fill in:
Subject: _____

Grade: _____

Concept No. Used: _____

In commenting on each episode used in your class, form. Feel free to adapt it and add more pages. Le your critiques and comments - negative and positive. hand column, please rate (poor, good, excellent) eac make specific comments or suggestions if possible in vided to help us make this a more usable guide. Tha

Poor	Good	Exc.	
			I. Behavioral Objectives A. Cognitive:
			B. Affective:
			II. Skills Developed
			III. Suggested Learning Experiences A. In Class:
			B. Outside & Community Activities:
			IV. Suggested Resource & Reference Materials (specific suggestions & comments)

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Gr

T I-C-E Episode Evaluation Form (Reproduce or duplicate as needed)

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___	
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___	

. Behavioral Objectives
A. Cognitive:

B. Affective:

. Skills Developed

. Suggested Learning Experiences
A. In Class:

B. Outside & Community Activities:

. Suggested Resource & Reference Materials
(specific suggestions & comments)

Project I-C-E
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